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IONOSPHERIC STRUCTURE OVER NORTHERN EUROPE

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) Tomographic images are presented of the spatial distribution of electron density in the sub-auroral ionosphere. The reconstructions have been obtained by inversion of total electron content measurements made at four stations in UK. The images cover the period from early January to mid-April 1993 and represent the first set of tomographic reconstructions obtained in monitoring the ionosphere over an extended period. Of particular interest is the spatial development of the main trough in the nighttime ionosphere. The potential of the tomographic method for routine observations of the ionosphere is demonstrated.			
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## INTRODUCTION

The background to the project was given in previous reports (Kersley, et.al., 1994<sup>1</sup> and references therein). The early part of the work was concerned with the study of ionospheric electron content and radio-wave scintillations in the sub-auroral ionosphere. The original experimental observations were made using a receiving system for transmissions from NNSS satellites located at Lerwick ( $60.1^{\circ}\text{N}$ ,  $1.2^{\circ}\text{W}$ ). Subsequent observations of the scintillation of the received signals were made at Whitby ( $54.5^{\circ}\text{N}$ ,  $0.6^{\circ}\text{E}$ ). In addition, a chain of four stations was established in UK (Figure 1), essentially in a meridian and covering same  $9^{\circ}$  latitude, to monitor total electron content using the differential doppler technique with a view to providing tomographic reconstructions of ionospheric electron density on an extended basis. Some examples of two-dimensional images of electron density obtained from the resultant data set were presented in an earlier report to illustrate the power of the tomographic method.

## RESULTS

The present report takes the form of an atlas of tomographic images obtained from successive satellite passes over this extended period from early-January to mid-April 1992. These serve to demonstrate the potential of ionospheric tomography in the routine monitoring of ionospheric electron density over a region of substantial spatial coverage. Of particular interest in the data presented here is the location and form of the main ionospheric trough, a key feature of the sub-auroral ionosphere. In the earlier part of the work, data from all available satellite passes were analysed to give complete diurnal coverage. However, it later became

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<sup>1</sup> Kersley, L., Russell, C.D., and Pryse, S.E. Ionospheric structure over northern Europe. Report AFOSR-91-0414, University of Wales, Aberystwyth, November 1994

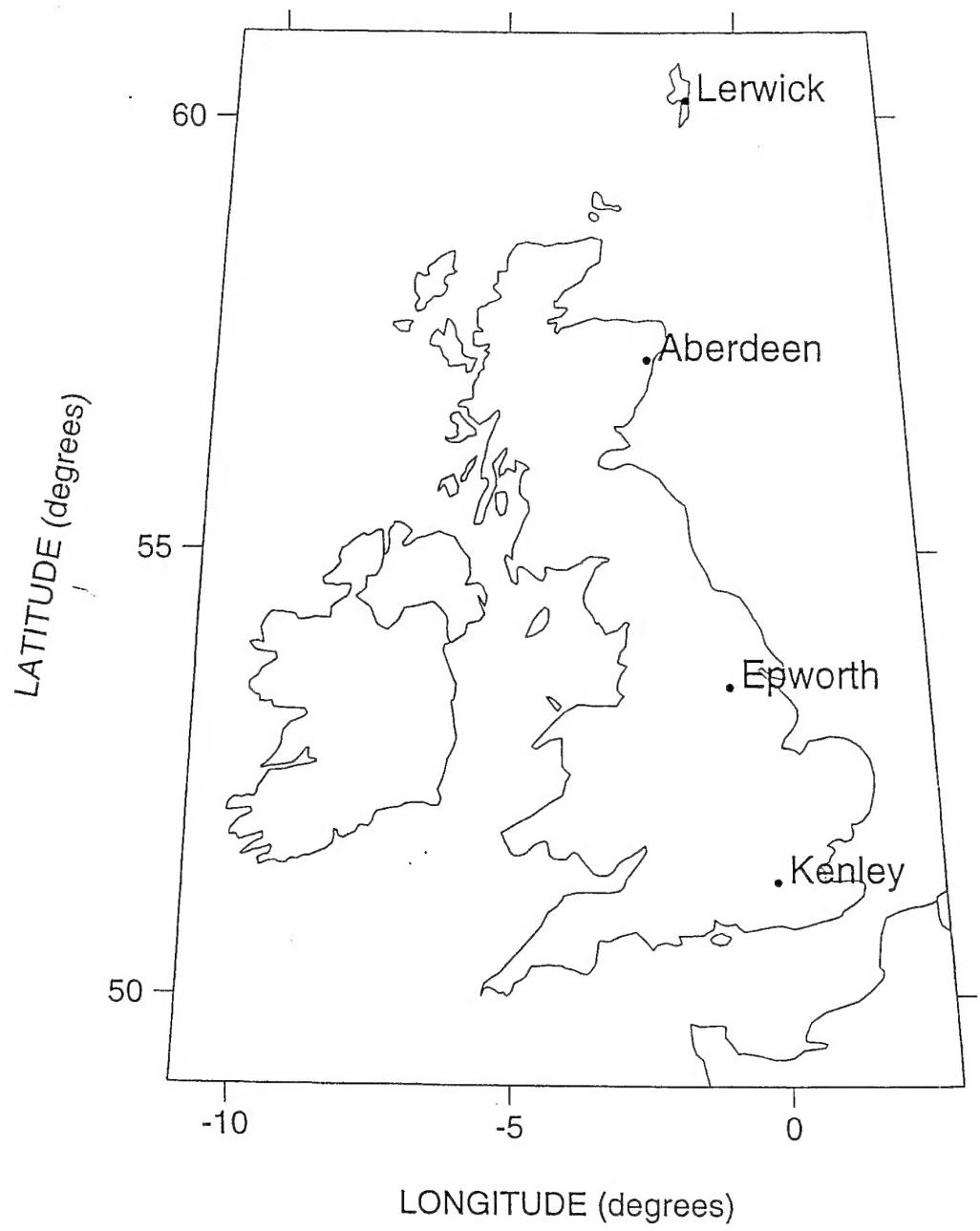


Figure 1

clear that it would not be possible to reconstruct images from all passes in the available time, so to some extent the analysis has been concentrated on the nighttime observations with the intention of bringing out the features of the trough. The results illustrate the power of the tomographic reconstruction technique as a routine monitor of the trough and serve to demonstrate the importance of the role of the trough in the nighttime sub-auroral ionosphere.

The images presented here have been obtained by inversion of the multistation total electron content measurements using a reconstruction method essentially similar to that described by Kersley et al (1993)<sup>2</sup>. The two-stage method involves the creation of an appropriate background ionosphere that is then used to initialise a MART iterative algorithm. For the present work the background has been based on the IRI90 model ionosphere, updated with input on the density and height of the layer peak obtained from the ionosonde at Slough (51.5°N) when available. The poor contouring of the bottomside ionosphere in a number of the tomographic images for daytime arises from E-layer input in the background model and represents a current limitation in ionospheric tomography. Work is progressing in developing techniques to image E-layer ionisation and to create smooth contouring in the valley region between the E- and F-layers. Another artefact of the method found in a few of the plots are the 'wings' or concentrations of contours along particular directions. These arise along lines where data from a particular station end due to loss of signal. The artefact can usually be identified with ease on the tomographic reconstruct as the concentration of the contours is directed downwards towards the latitude of one of the receiving stations.

The images of electron density shown here represent the first set of comprehensive results from the tomographic method over an extended period of several months.

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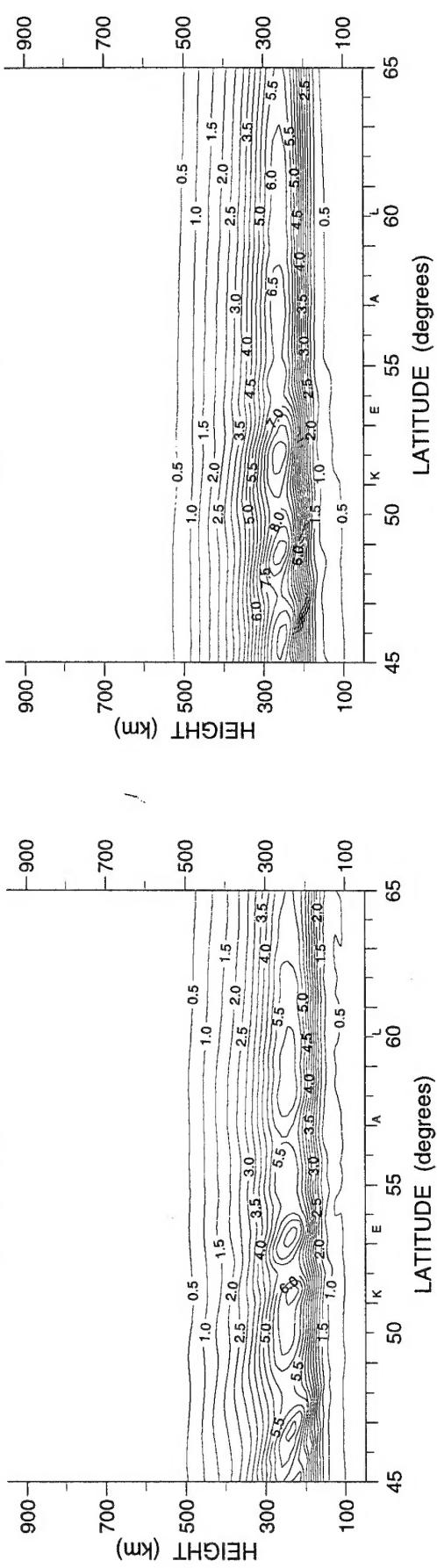
<sup>2</sup> Kersley, L., Heaton, J.A.T., Pryse, S.E., and Raymund, T.D., Experimental ionospheric tomography with ionosonde input and EISCAT verification, *Ann. Geophysical*, 11, 1064-1074, 1993

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They serve to illustrate the potential power of ionospheric tomography in the routine monitoring of structures in the electron density like the mid-latitude trough.

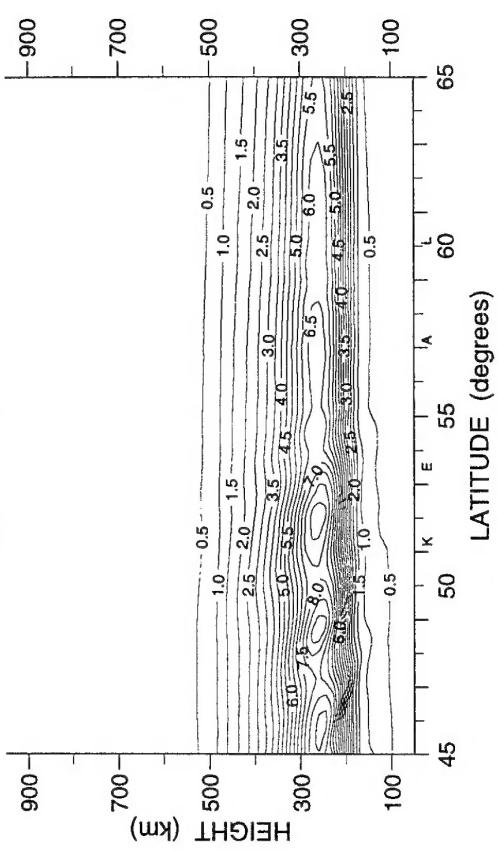
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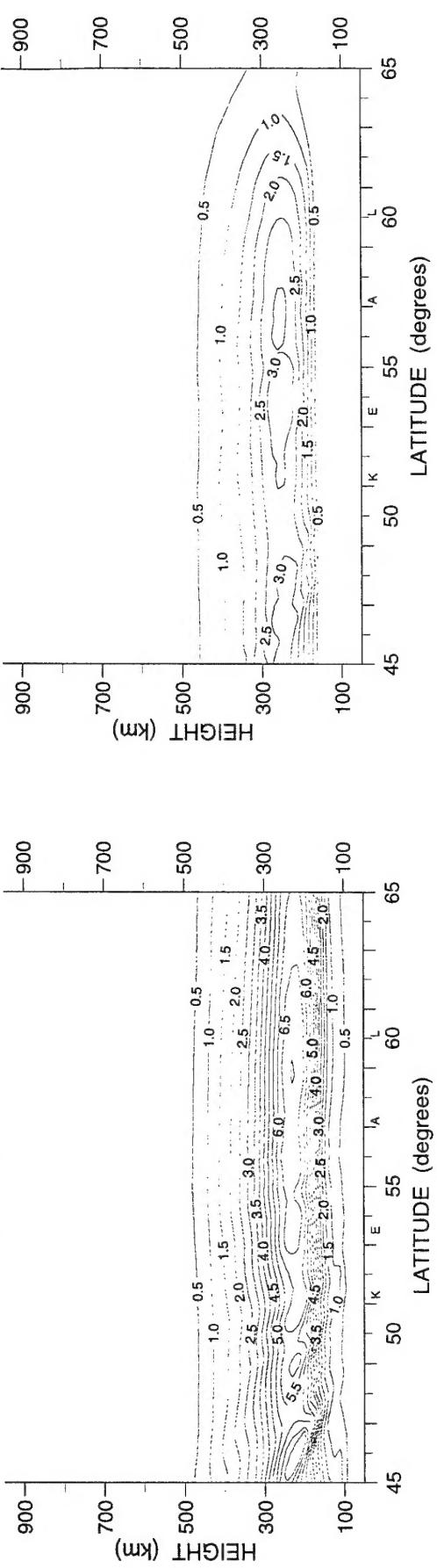
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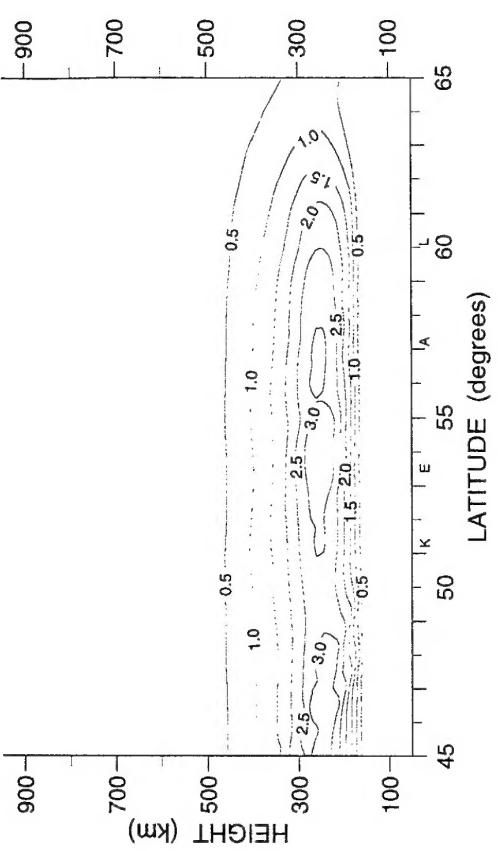
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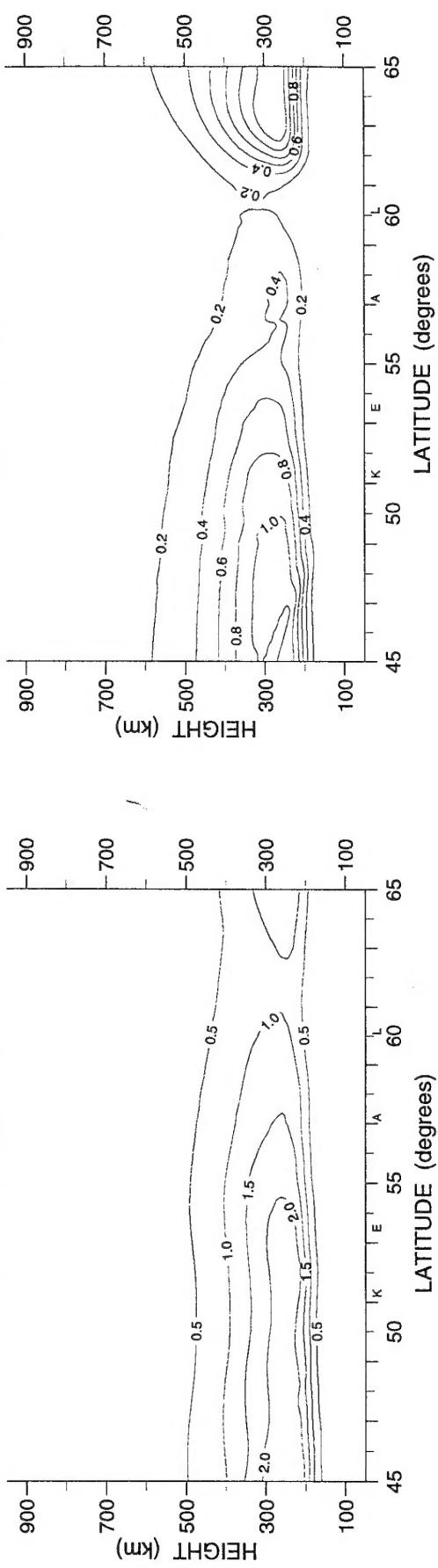


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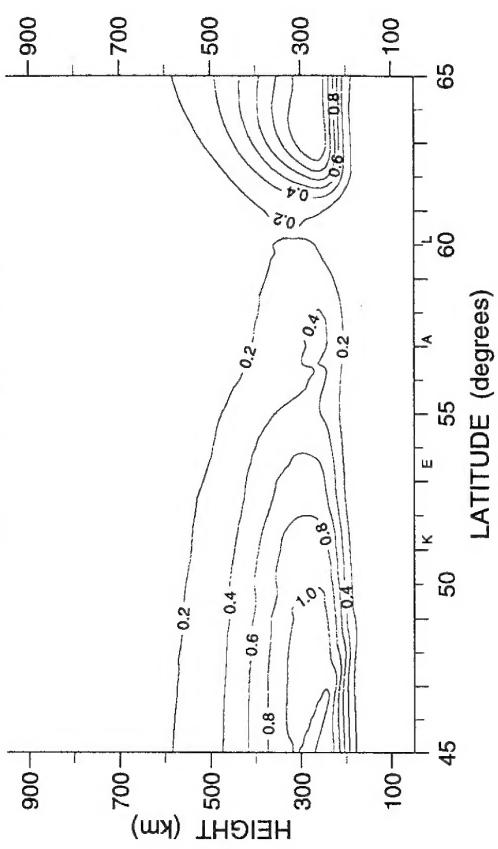
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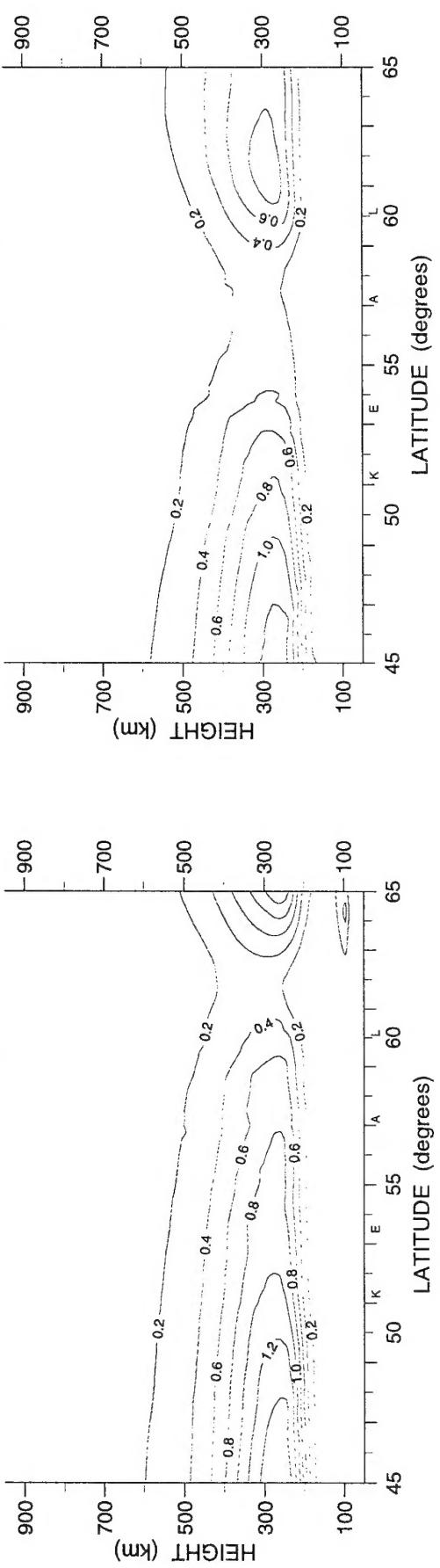
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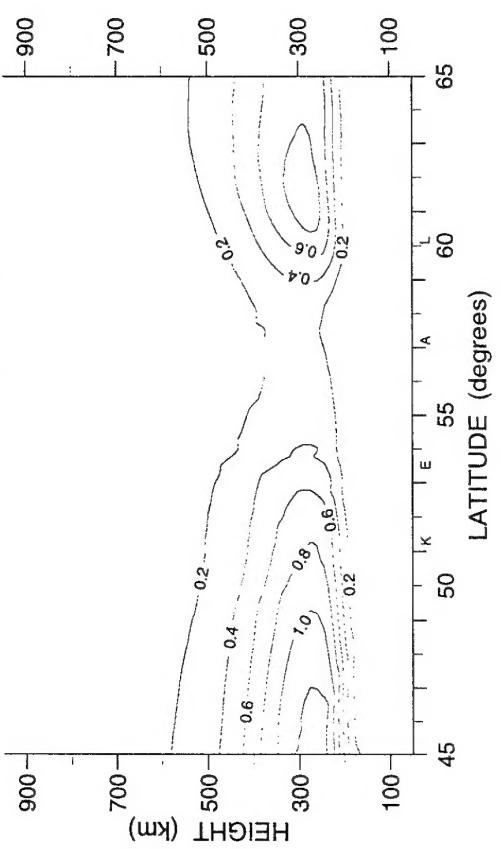
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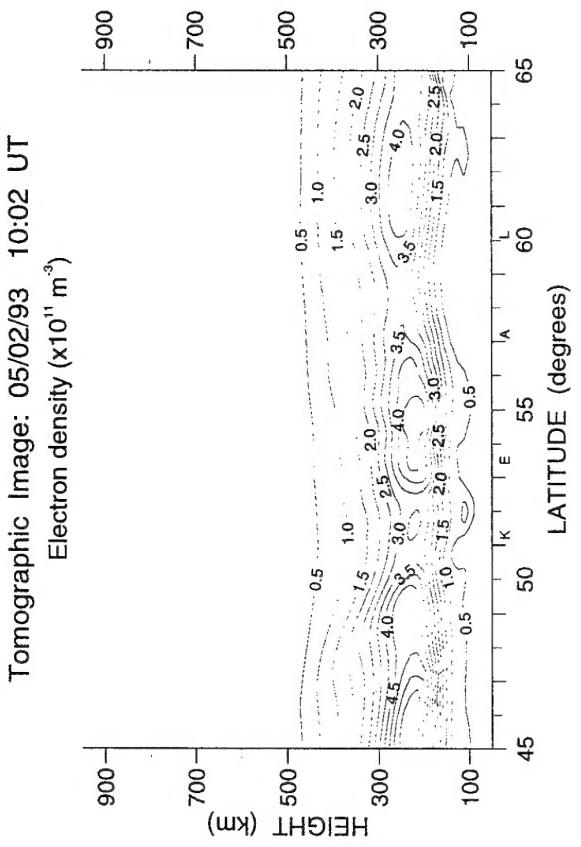
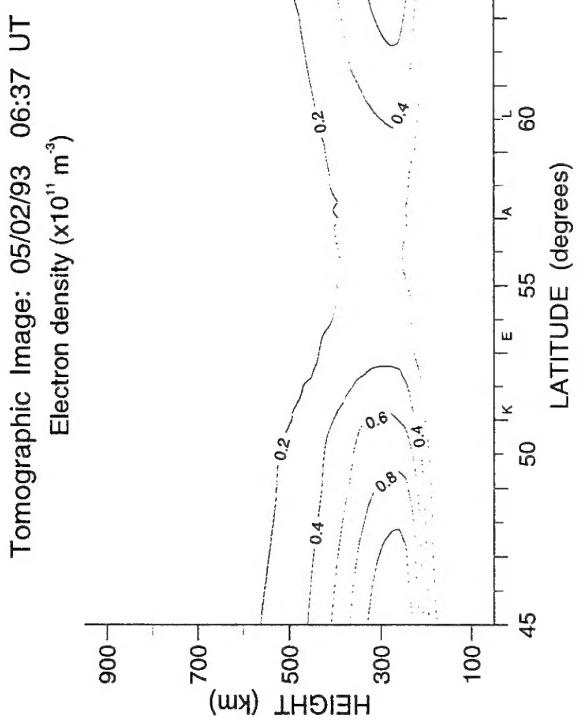
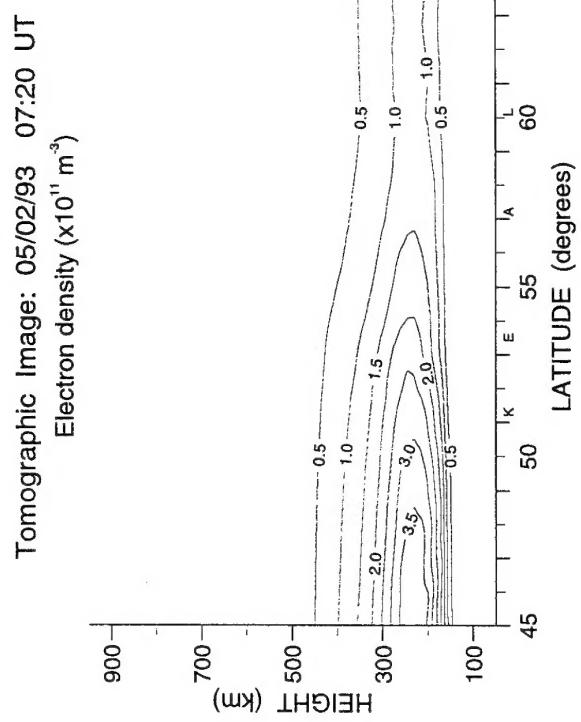
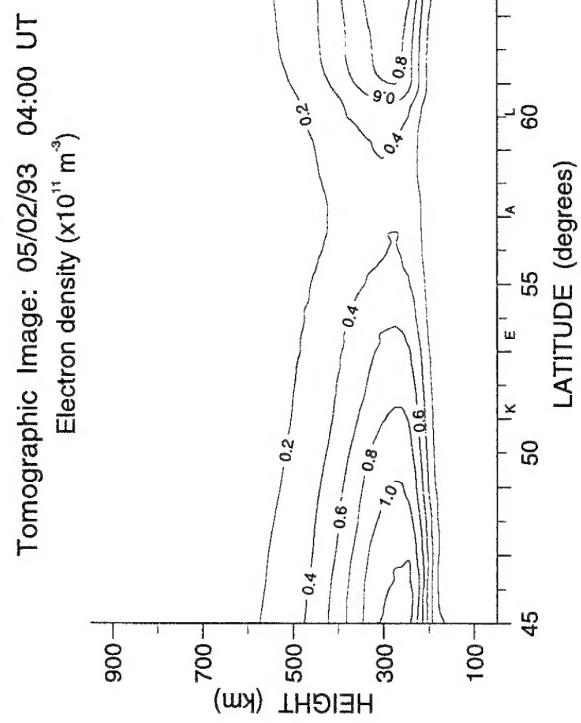


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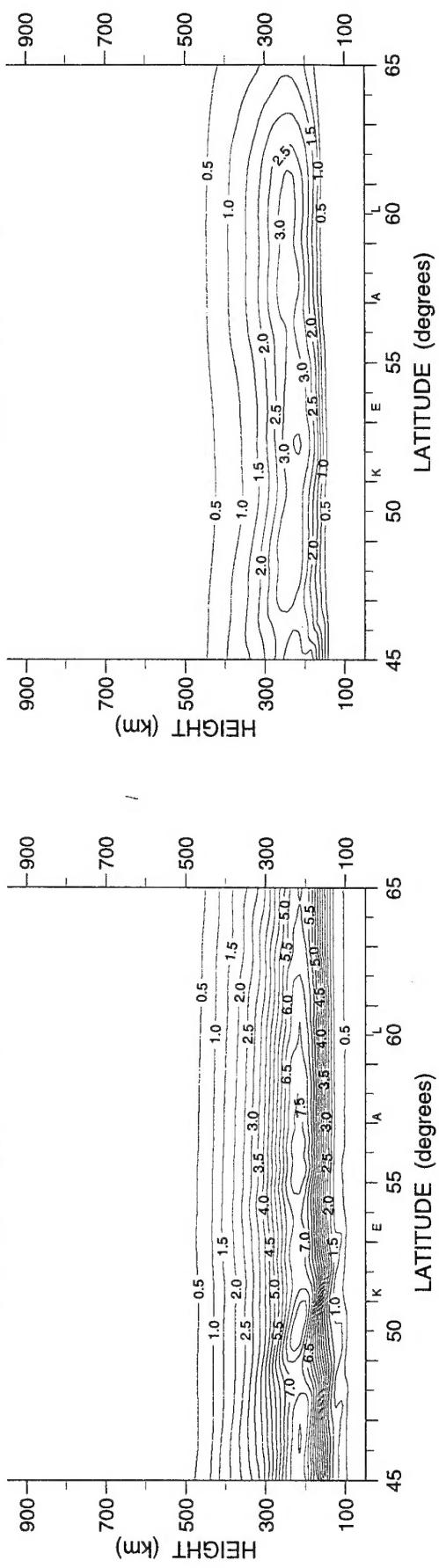


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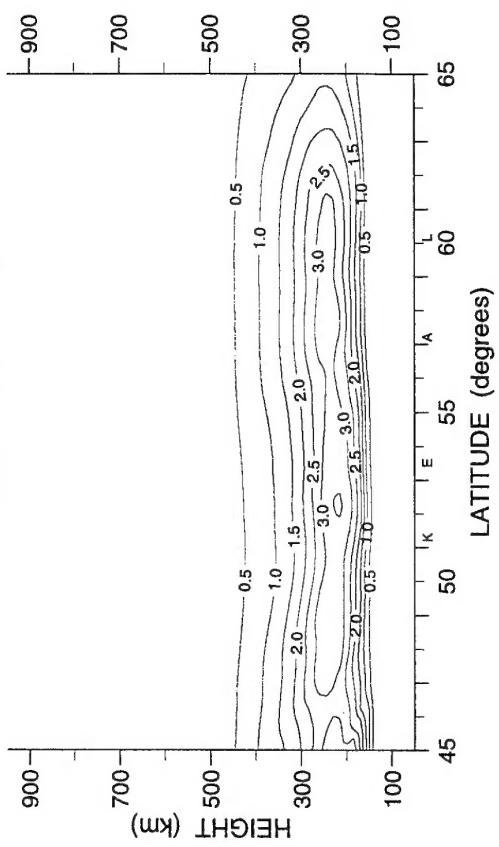




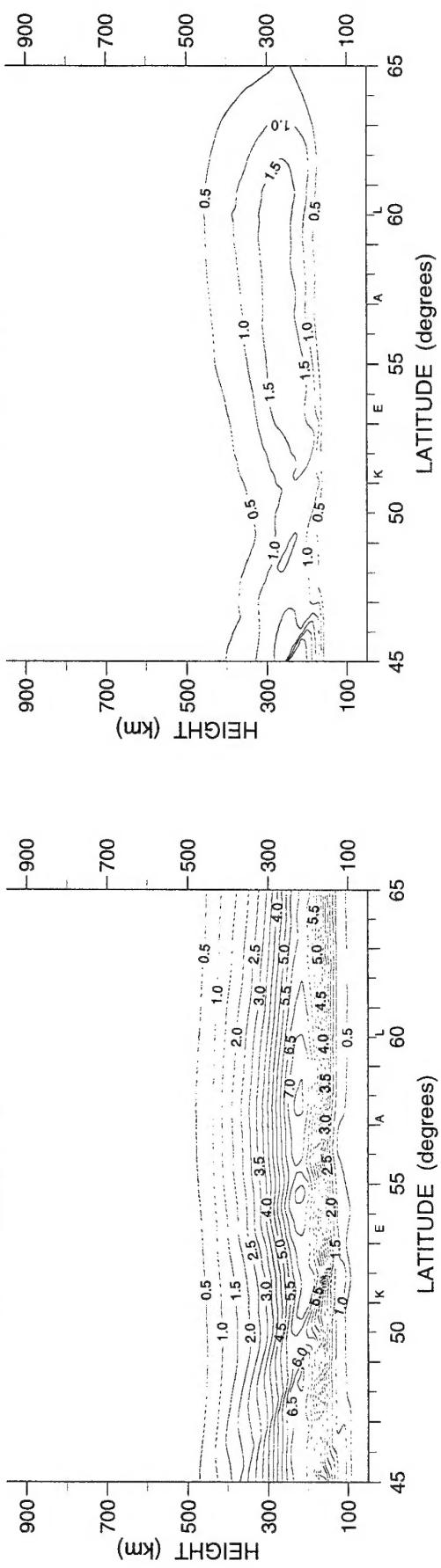
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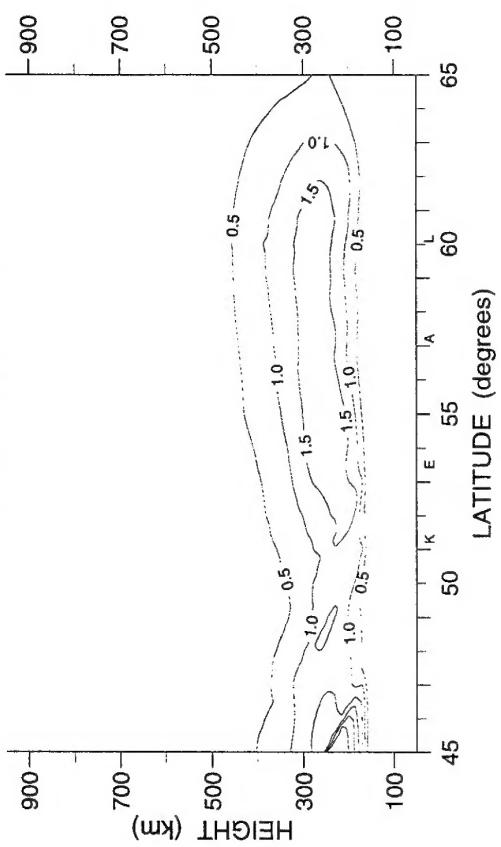
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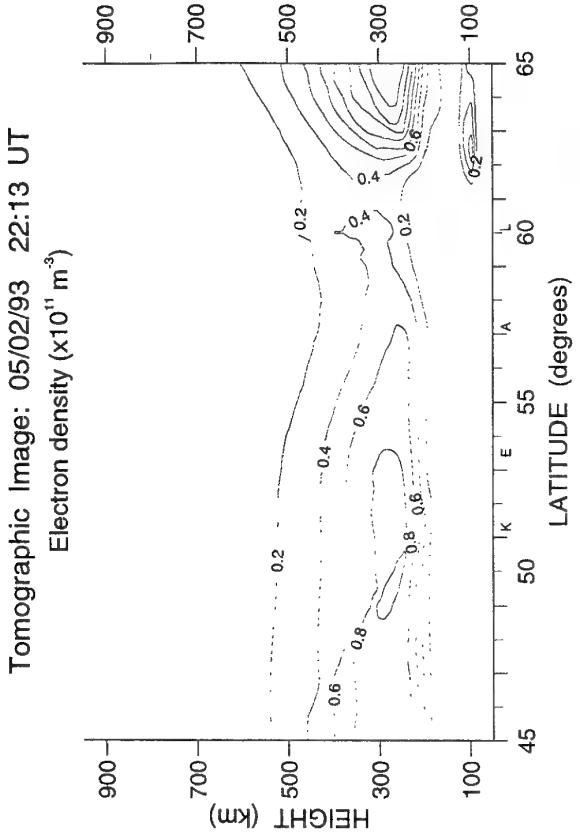
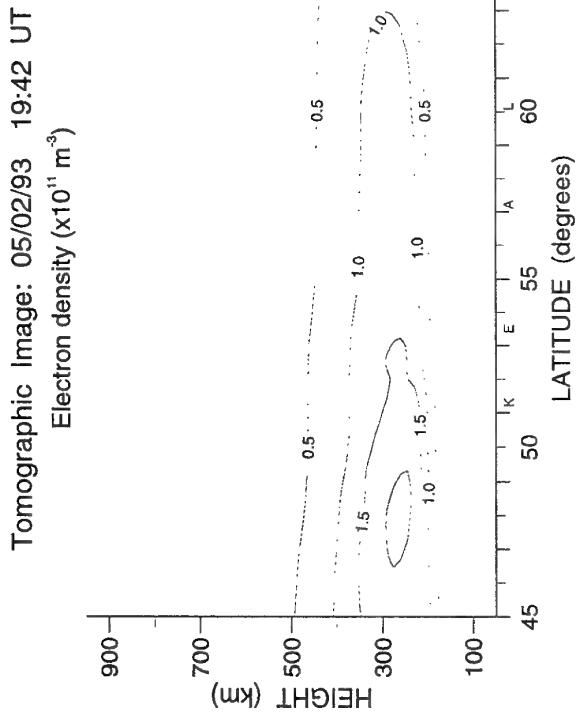
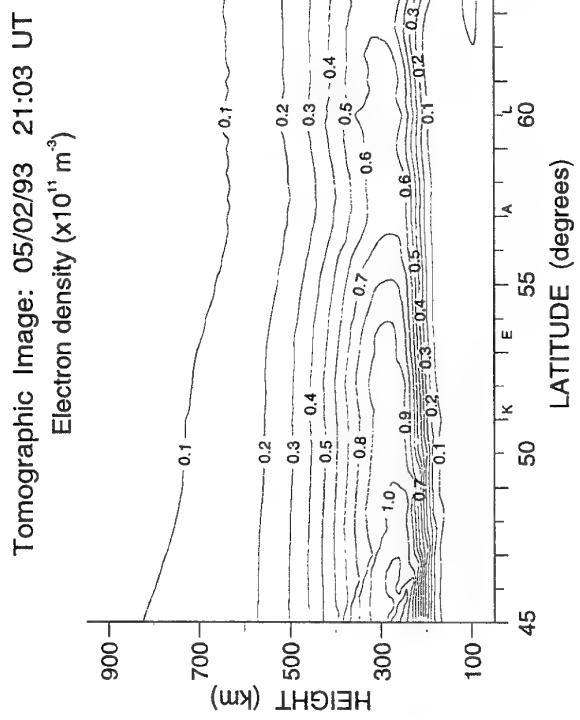
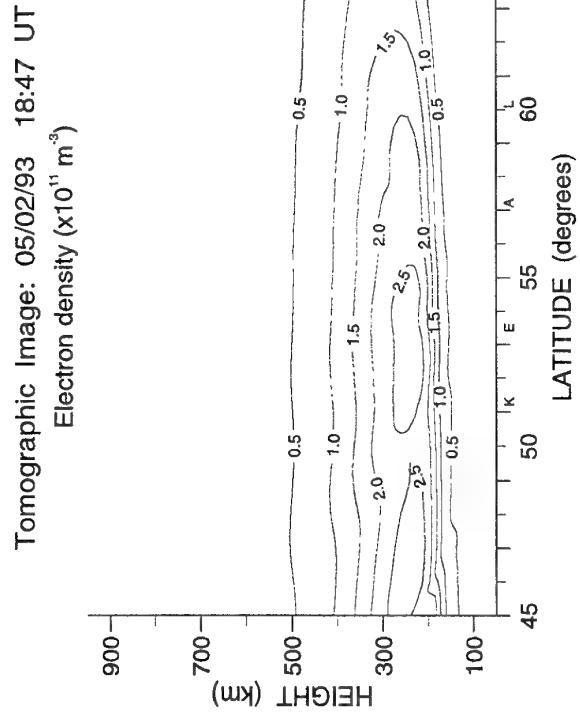


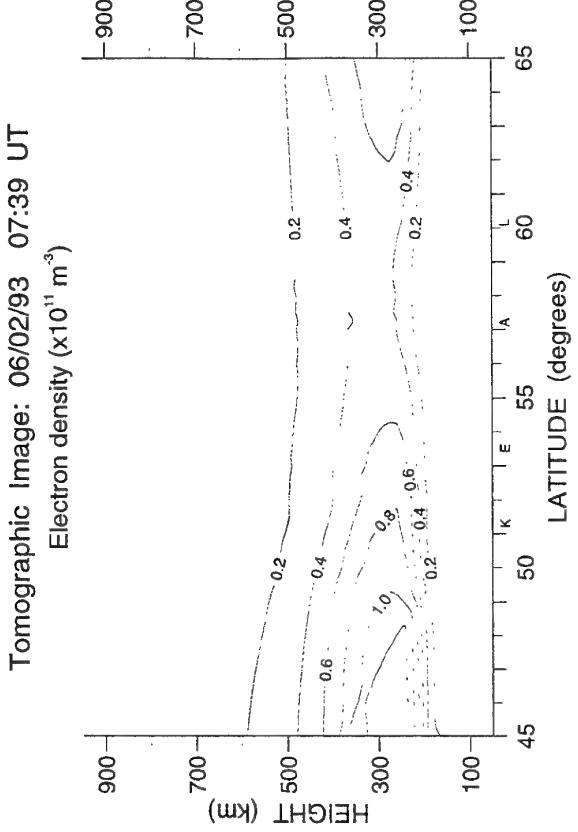
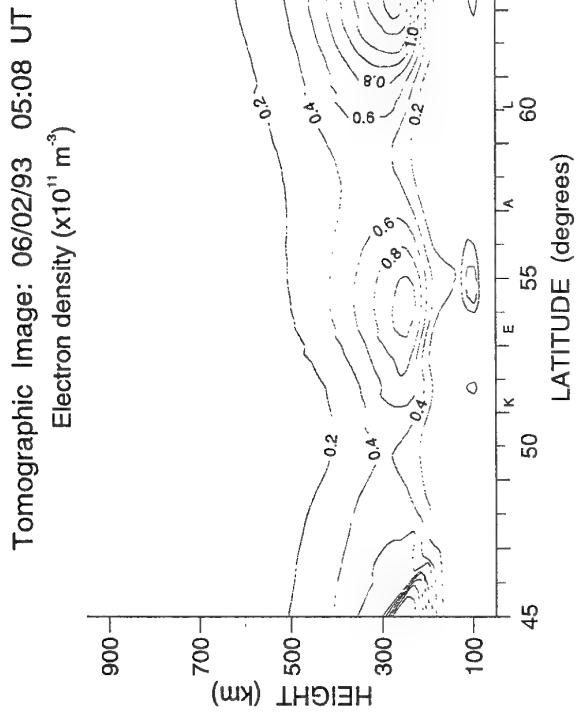
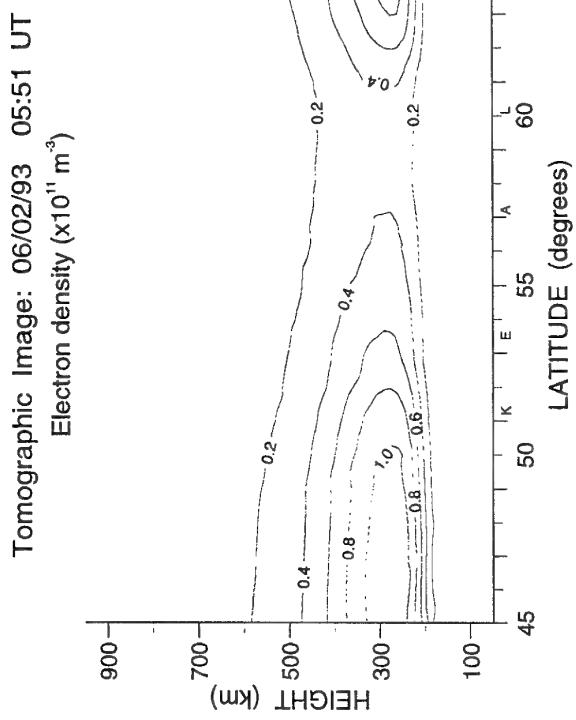
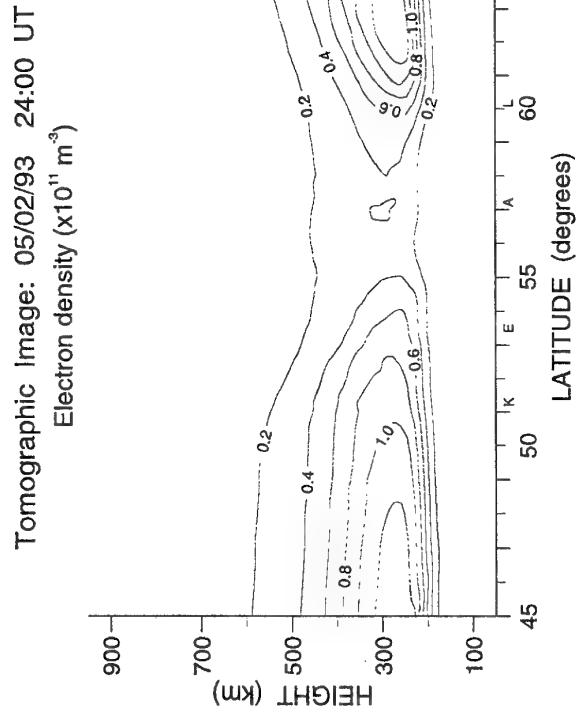
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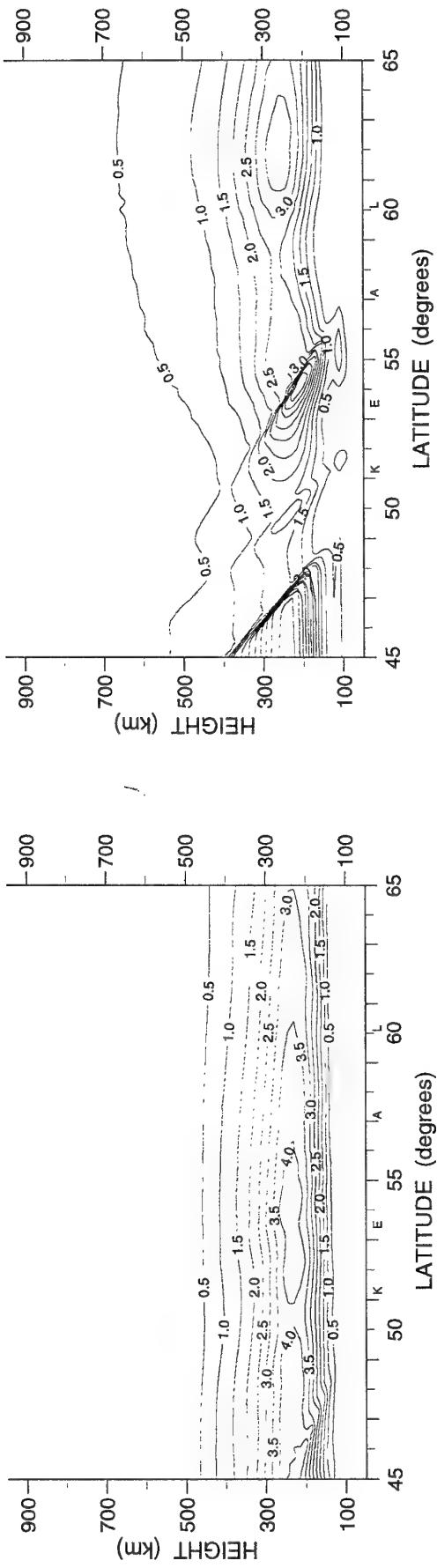
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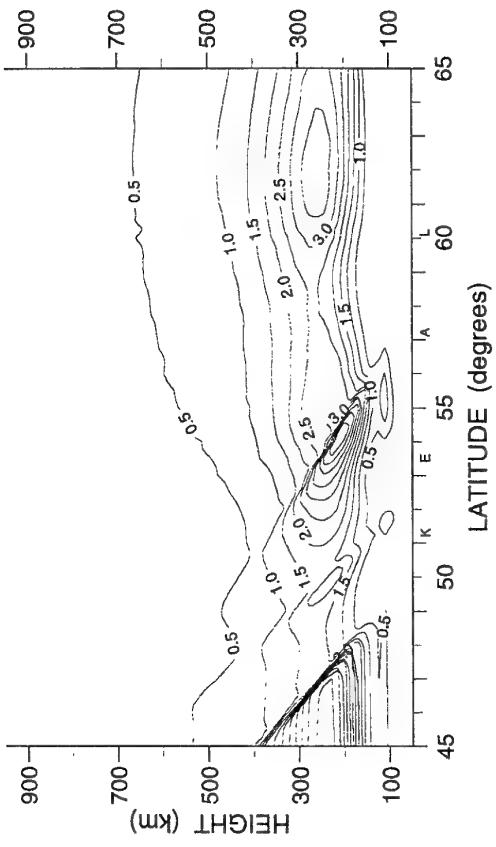




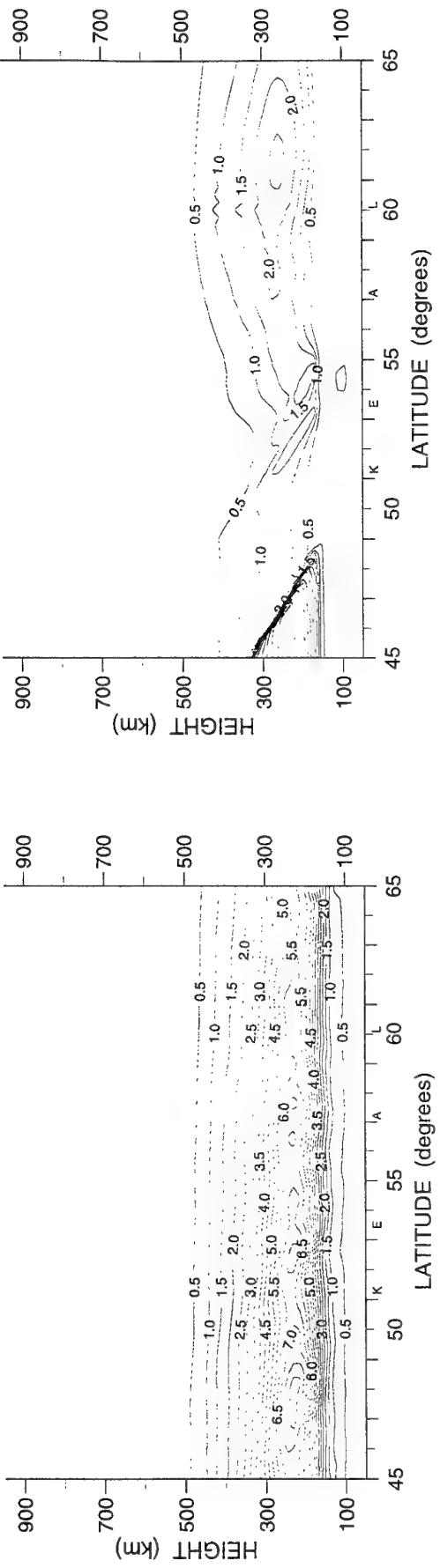
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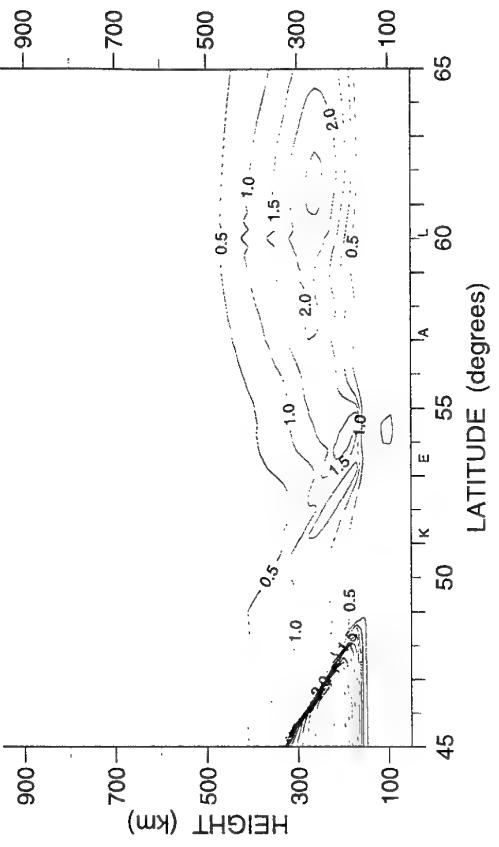
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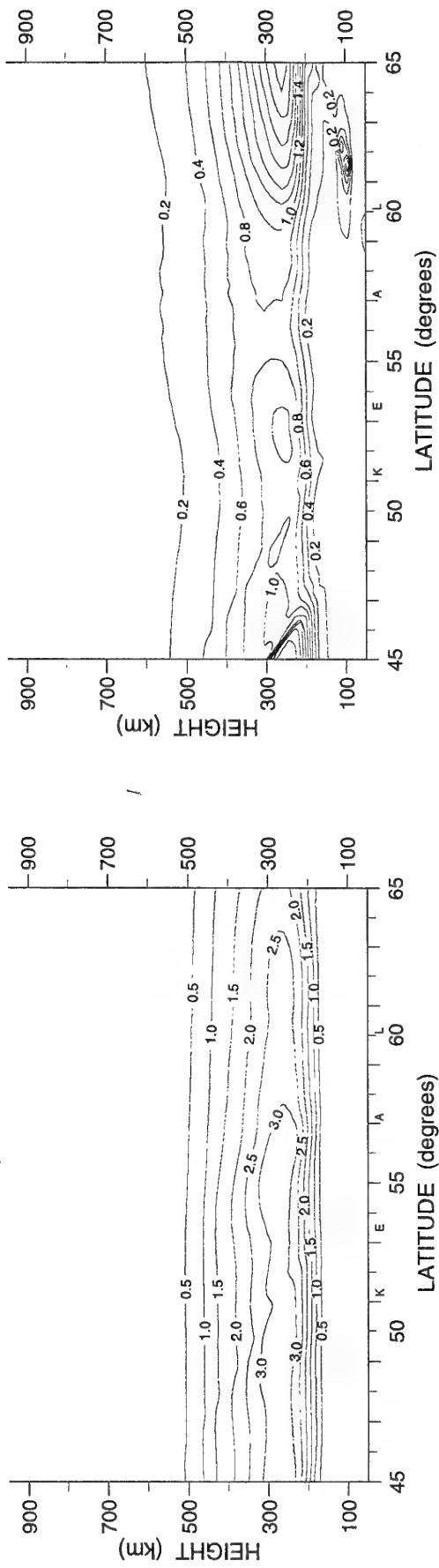
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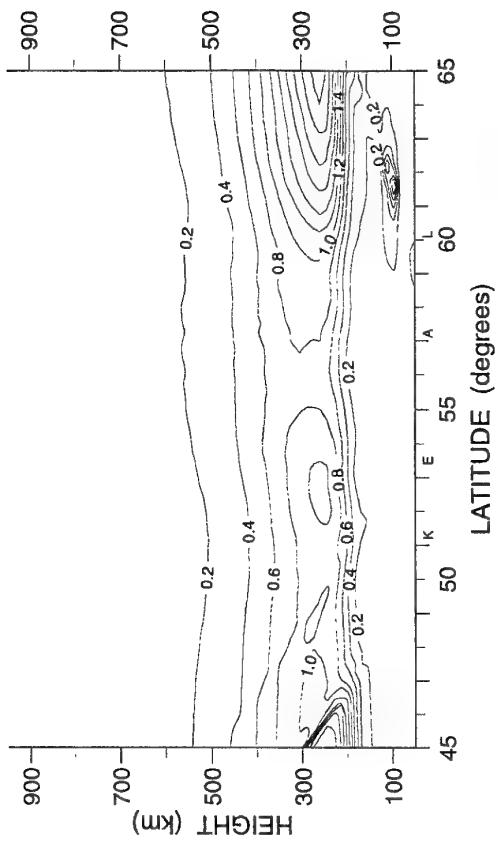
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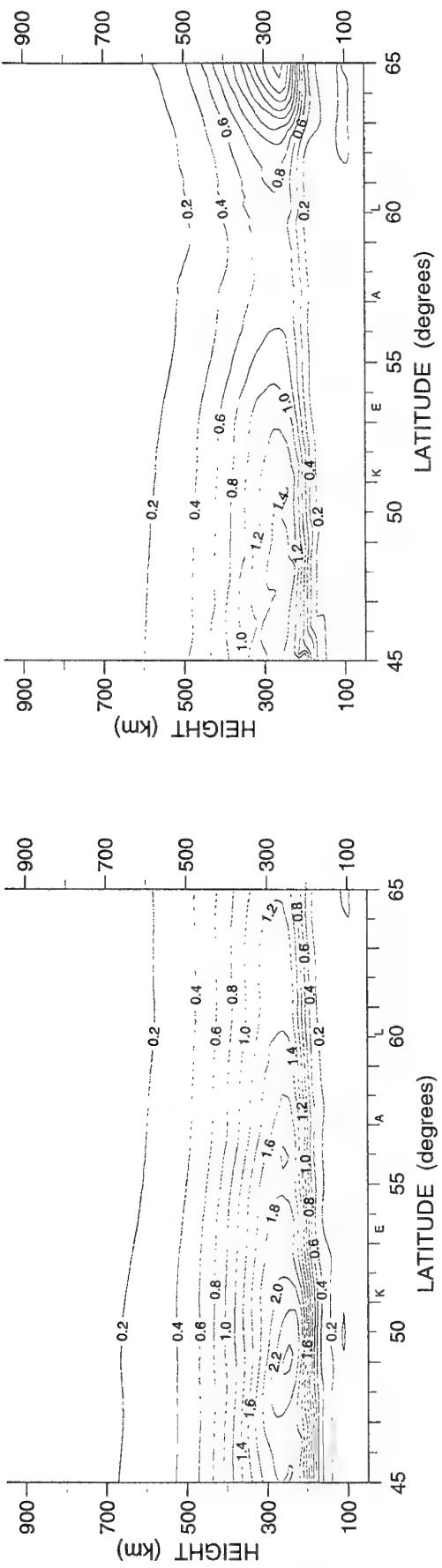
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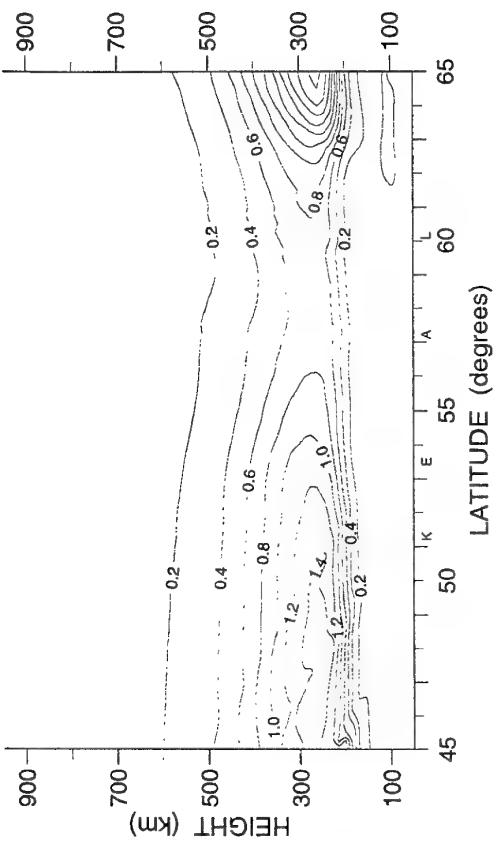
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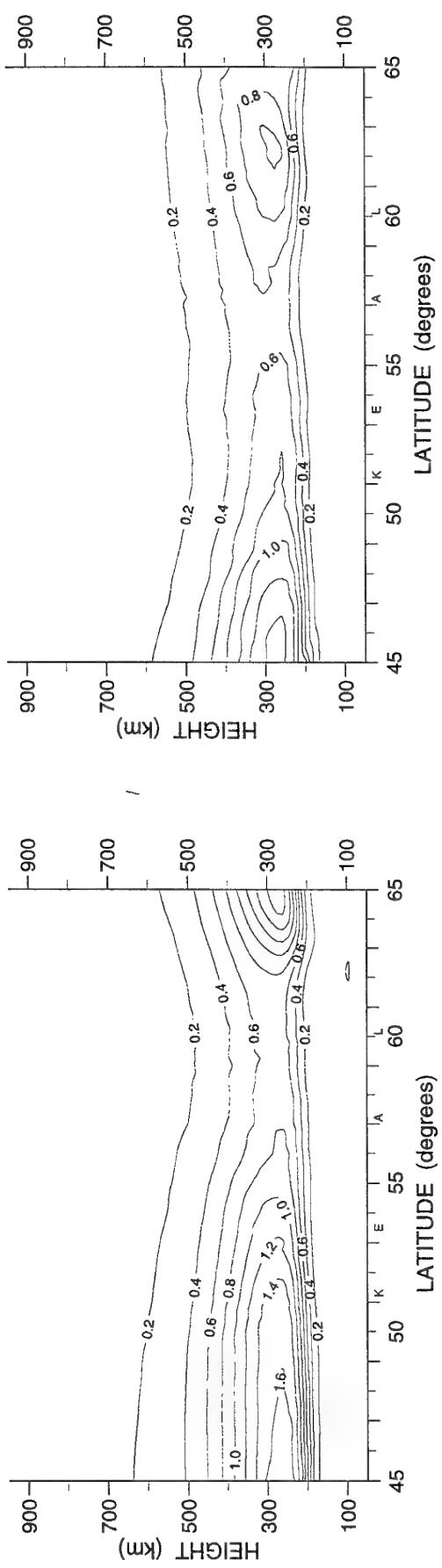
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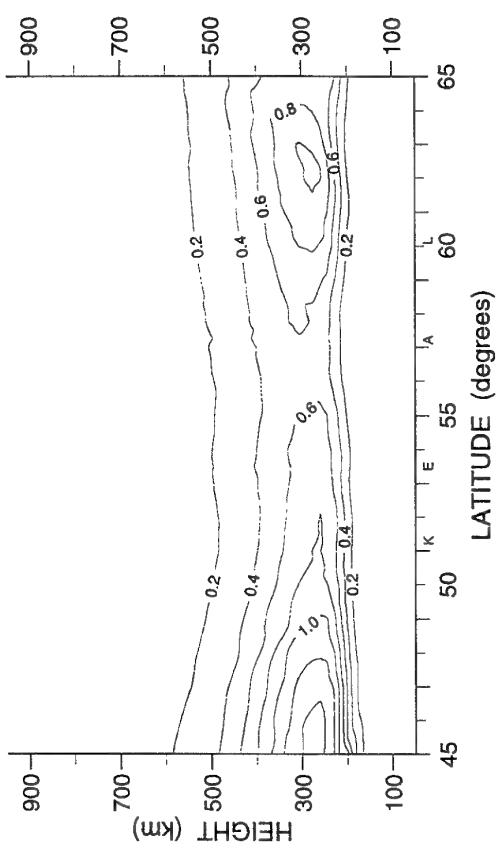
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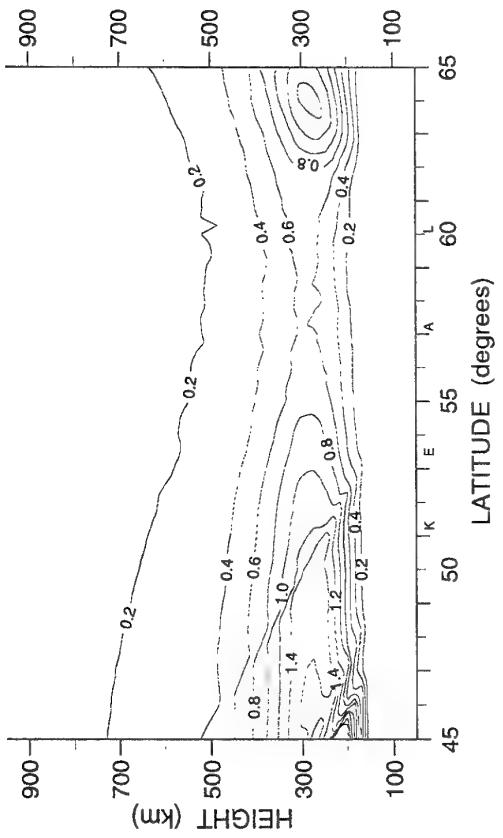
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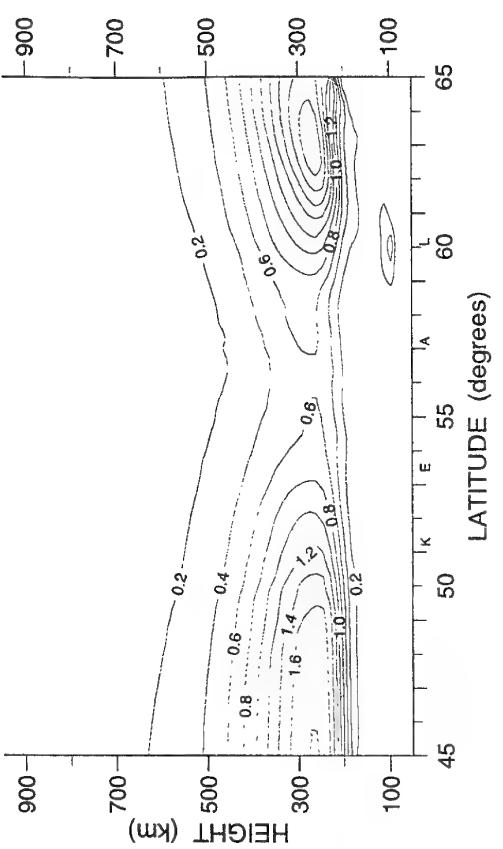
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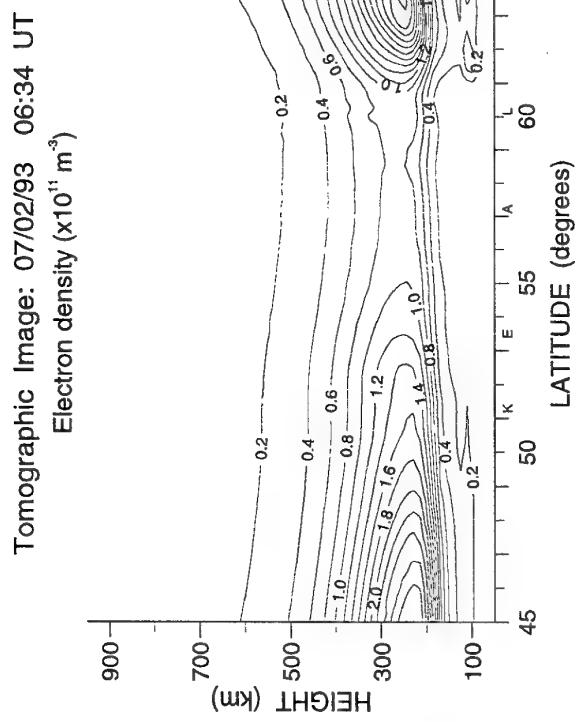


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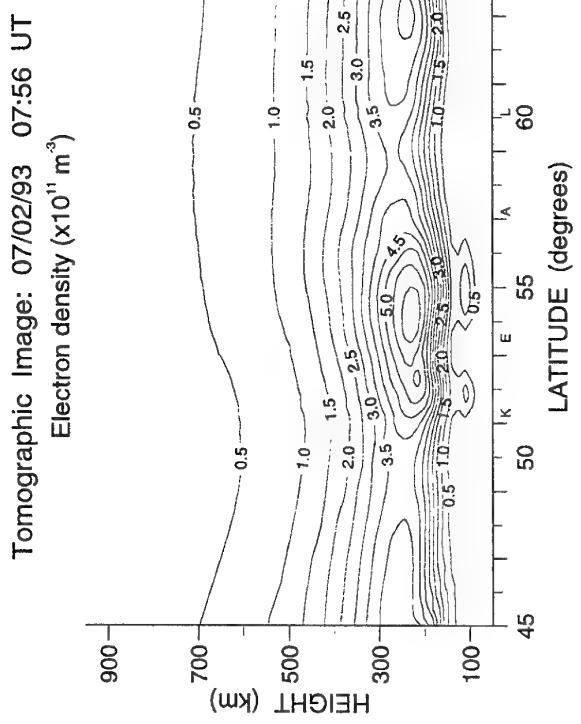


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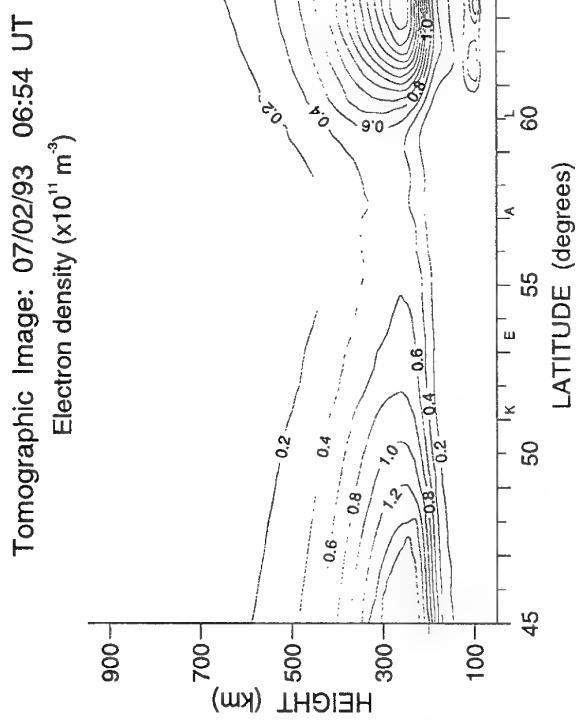




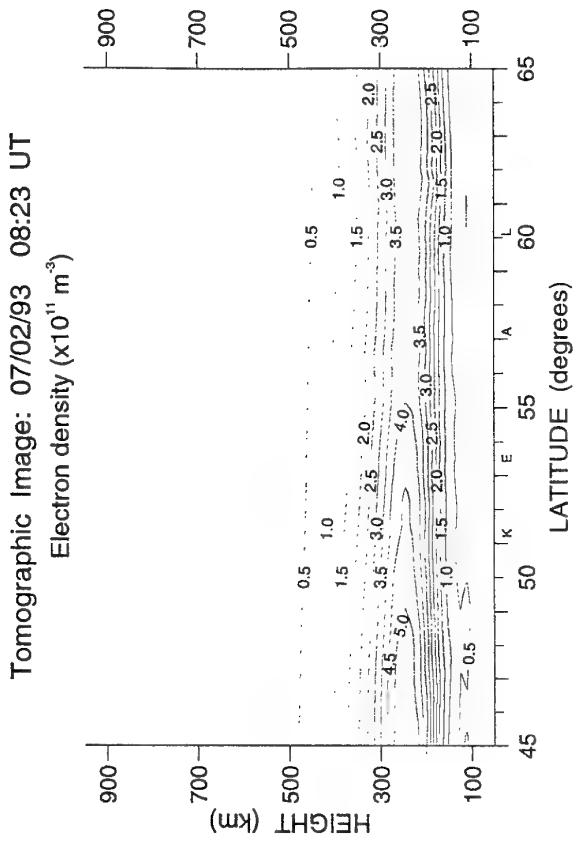
The figure is a tomographic image showing the distribution of electron density in the upper atmosphere. The vertical axis is labeled "HEIGHT (km)" and ranges from 100 to 900 km. The horizontal axis is labeled "LATITUDE (degrees)" and ranges from 45 to 60 degrees. Contour lines represent electron density values, with labels indicating values such as 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0, 4.0, 6.2, and 10. The contours show higher electron density at lower heights and higher latitudes, with a prominent peak around 300-400 km height and 55-60 degrees latitude.



The figure displays a tomographic image of electron density in Earth's atmosphere. The vertical axis represents Height in kilometers, ranging from 900 down to 100. The horizontal axis represents Latitude in degrees, ranging from 45 to 60. Contour lines represent electron density values, with labels indicating values such as 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.5, 5.0, 30, 20, 10, 5, and 2. The highest electron densities are found at lower heights (around 100-200 km) and higher latitudes (around 55-60 degrees), forming a distinct peak. Lower densities are generally found at higher heights and lower latitudes.

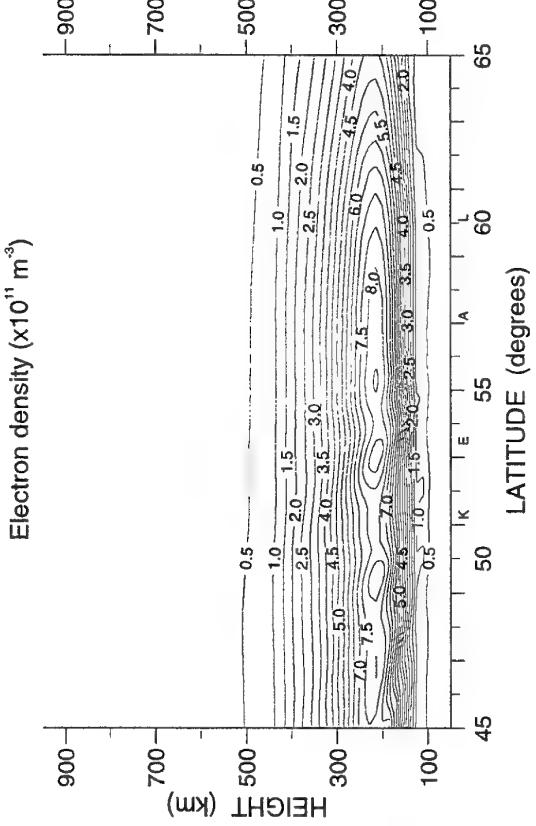


This figure displays a tomographic reconstruction of Earth's ionosphere. The vertical axis represents Height in kilometers, ranging from 100 km at the bottom to 900 km at the top. The horizontal axis represents Latitude in degrees, ranging from 45°N to 60°N. Contours represent electron density, with values labeled in units of  $\times 10^{11} \text{ m}^{-3}$ . The highest electron densities are found near the equator (0° latitude) at lower heights (around 300-400 km), peaking at approximately  $1.2 \times 10^{11} \text{ m}^{-3}$ . As height increases, the electron density generally decreases, with significant horizontal gradients. At higher latitudes (around 55°N), there are distinct density features at various heights, such as a peak around 300 km and another around 600 km.

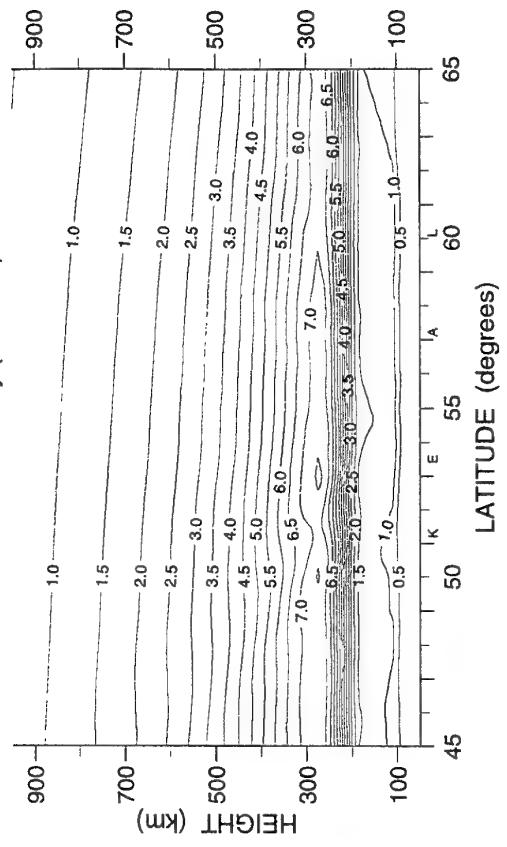


The figure is a tomographic image showing the distribution of electron density in the Earth's ionosphere. The vertical axis is labeled "HEIGHT (km)" and ranges from 100 to 900 km. The horizontal axis is labeled "LATITUDE (degrees)" and ranges from 45 to 65 degrees. Contours represent electron density values, with labels indicating values such as 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, and 900. The highest electron densities are found at lower heights (around 100-200 km) and higher latitudes (around 60-65 degrees), while densities decrease as height increases and latitude decreases.

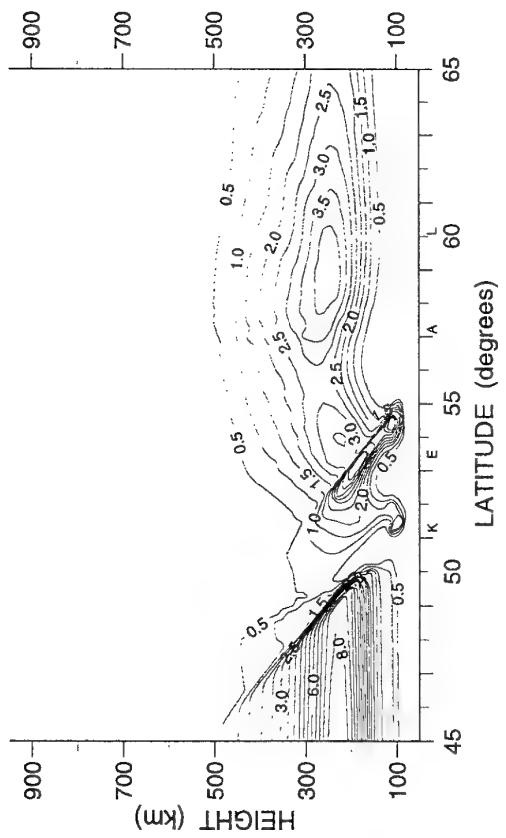
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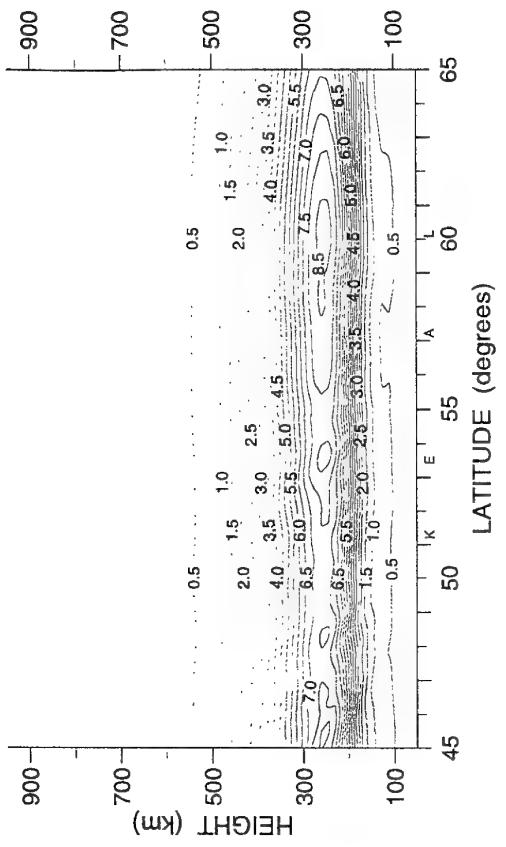
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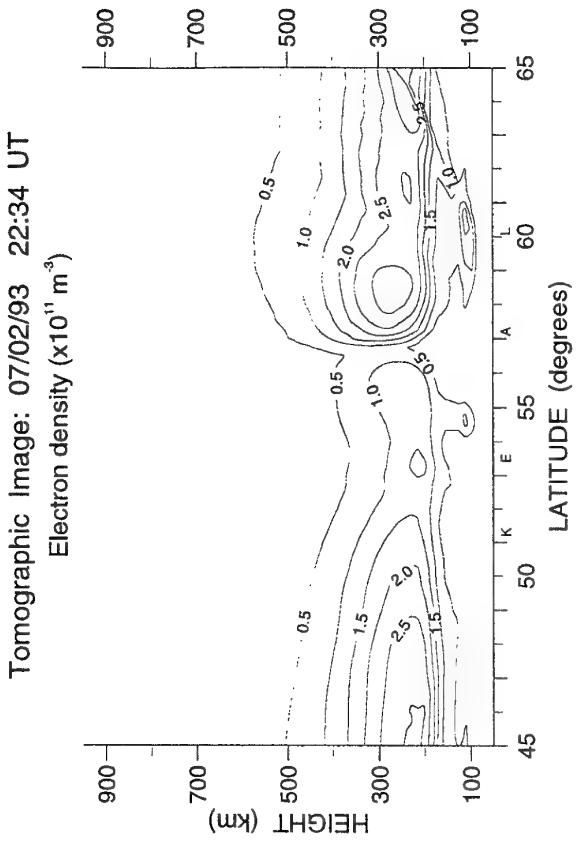
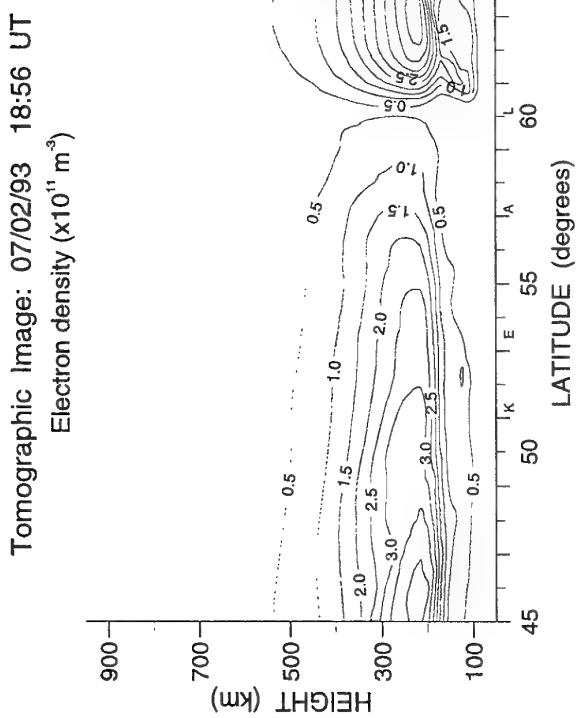
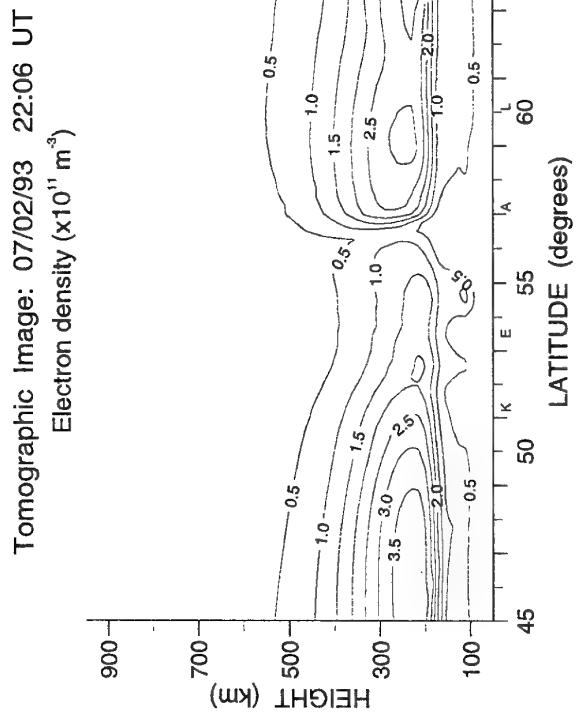
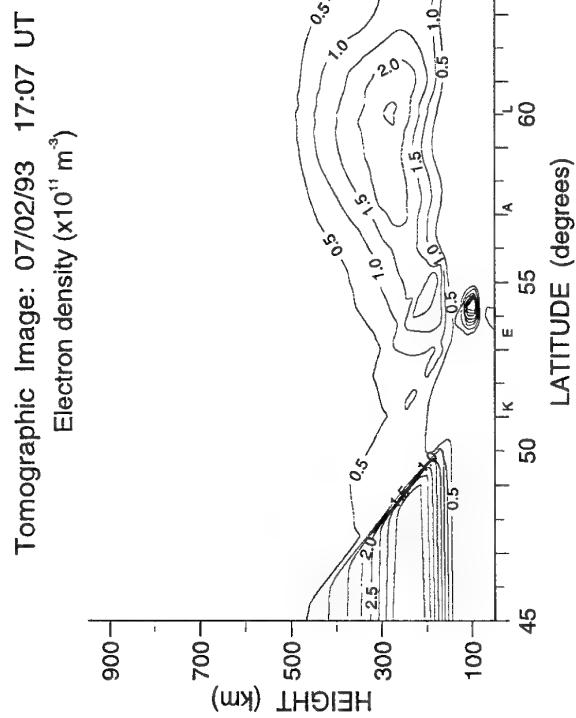


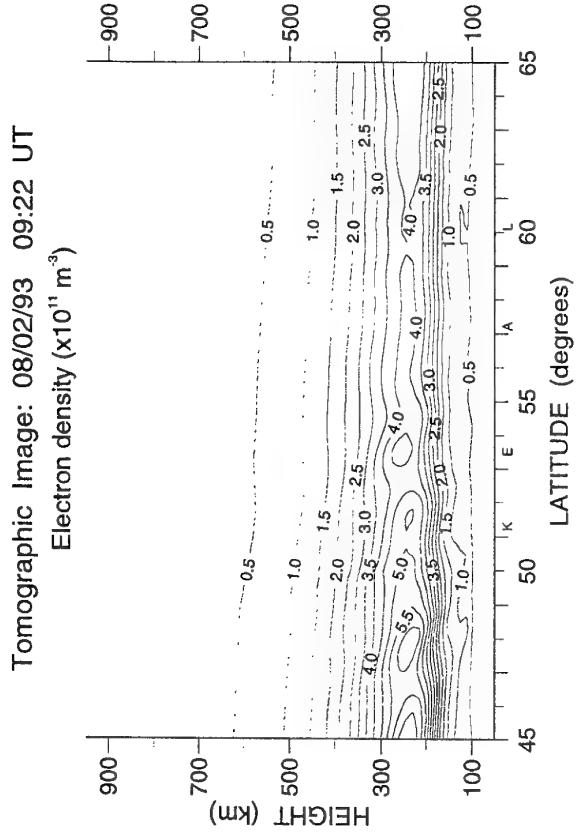
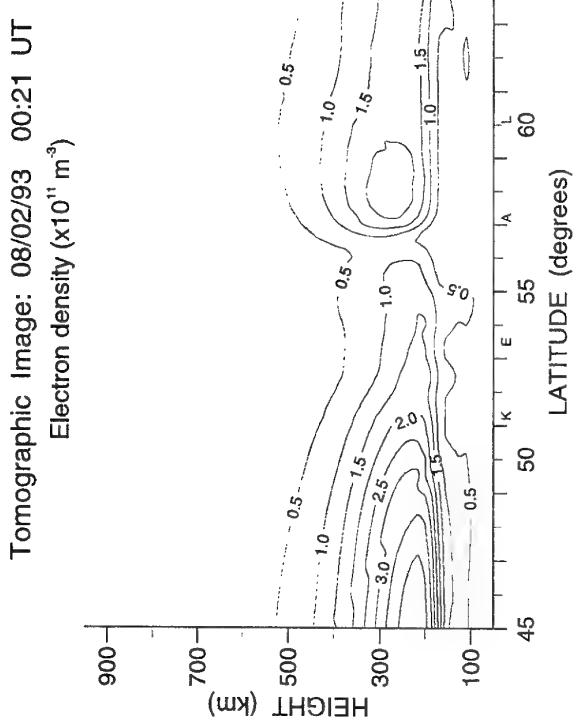
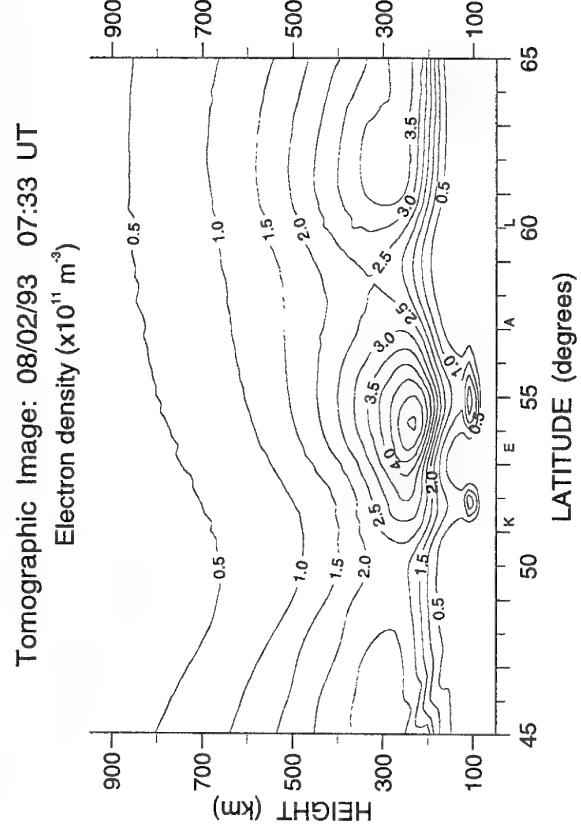
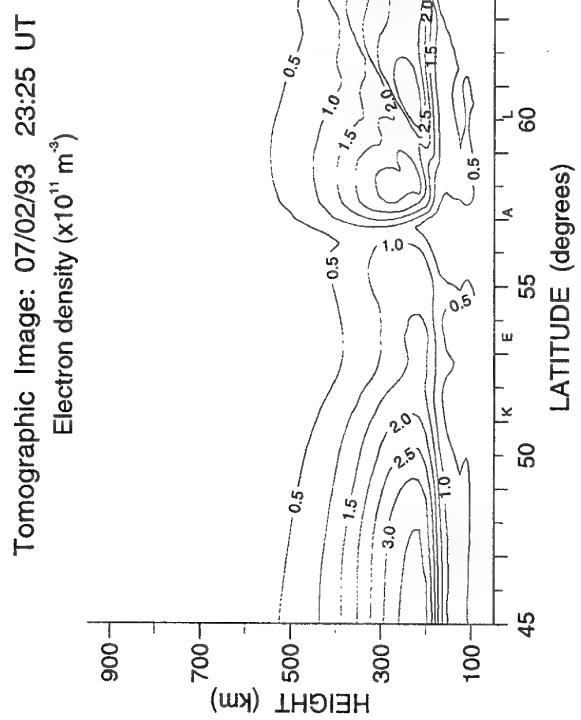
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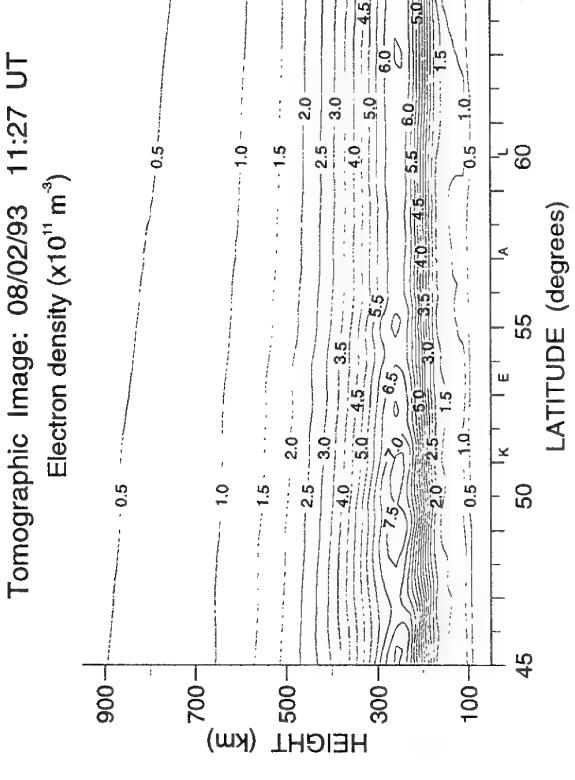
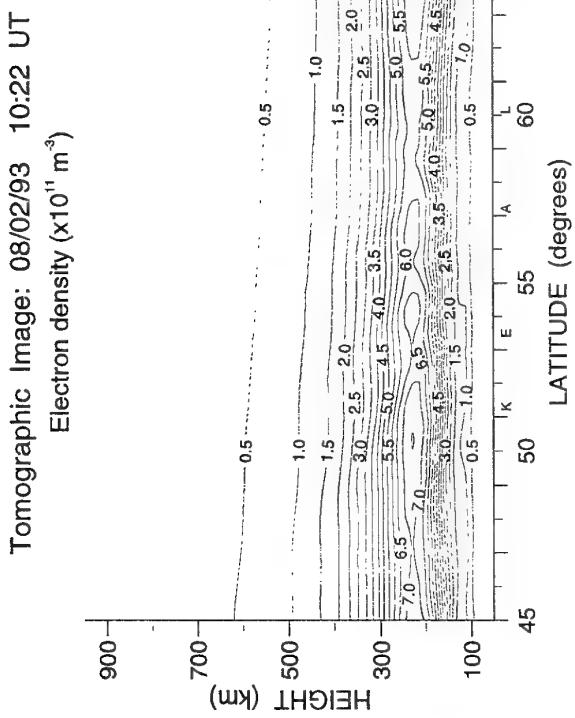
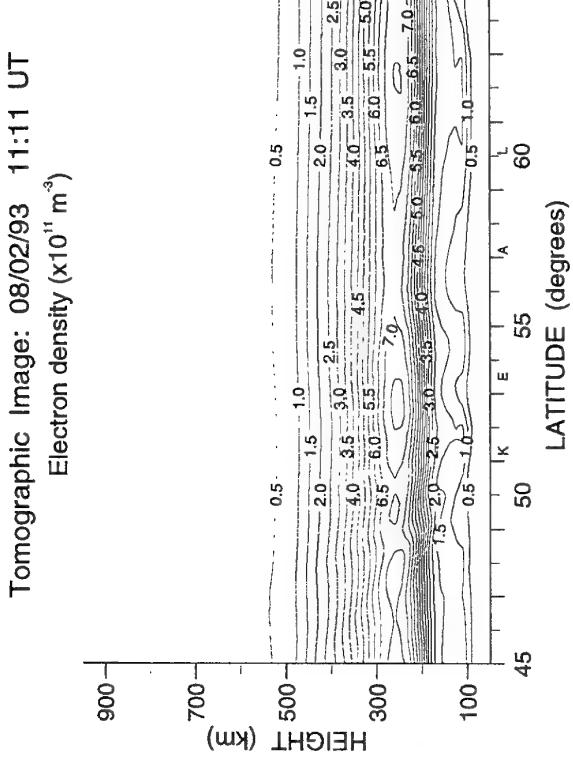
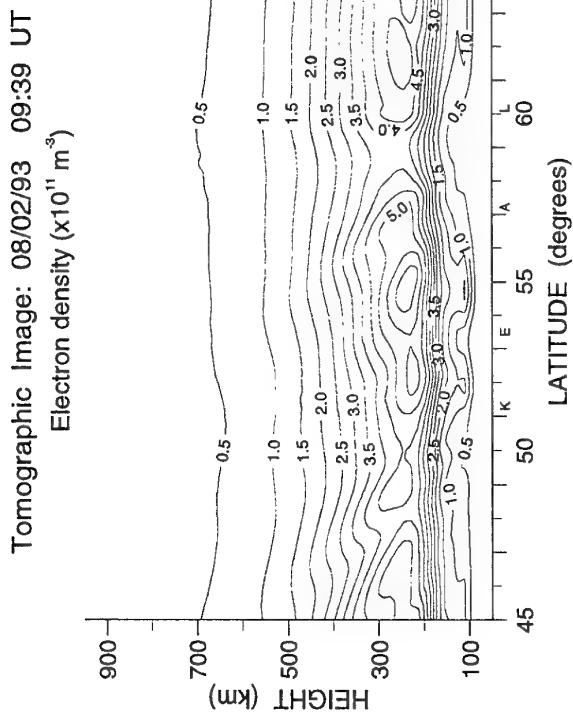


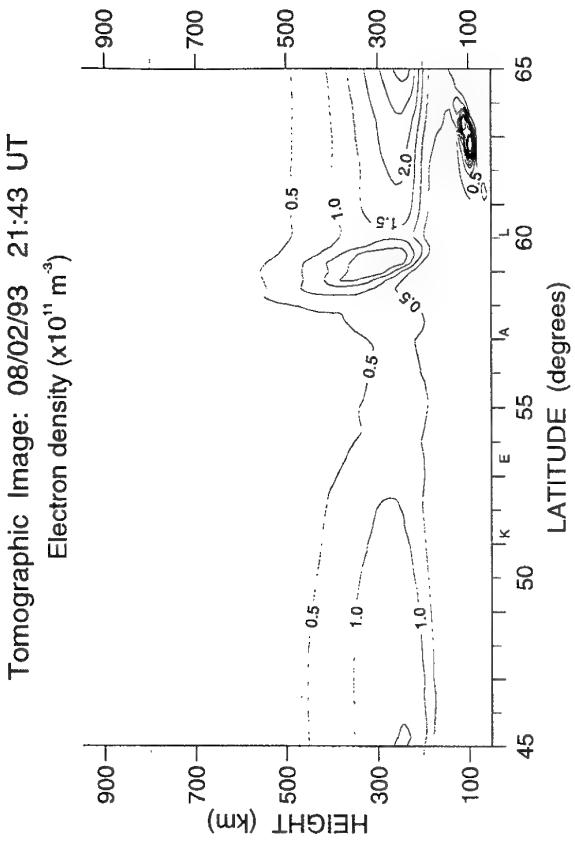
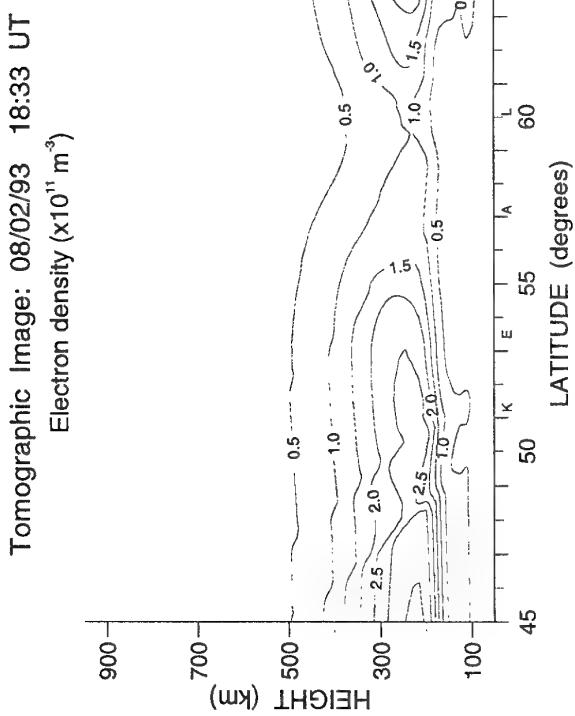
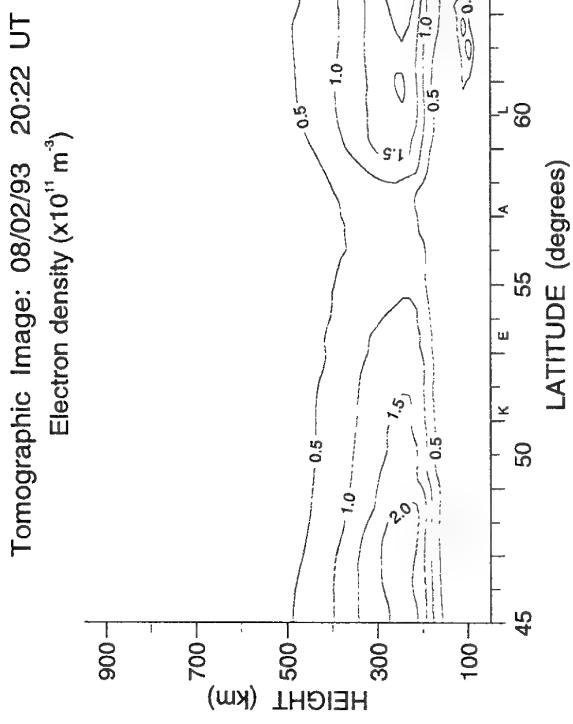
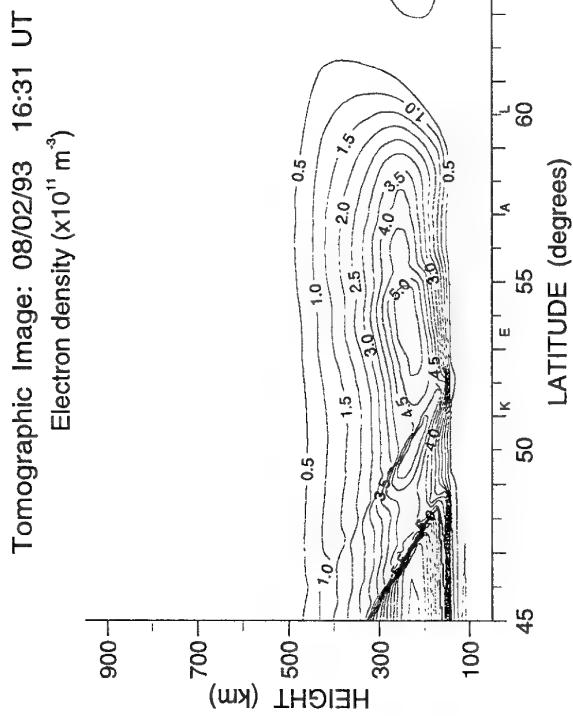
Tomographic Image: 07/02/93 15:24 UT

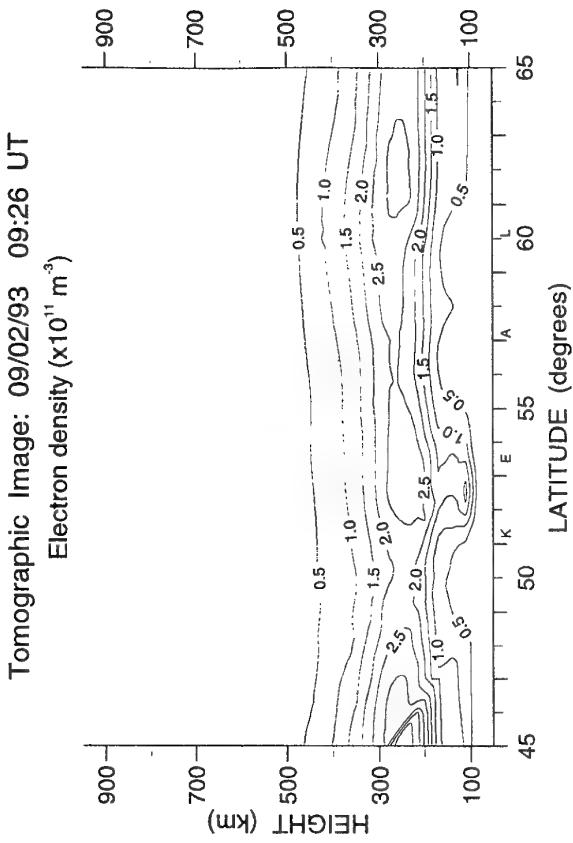
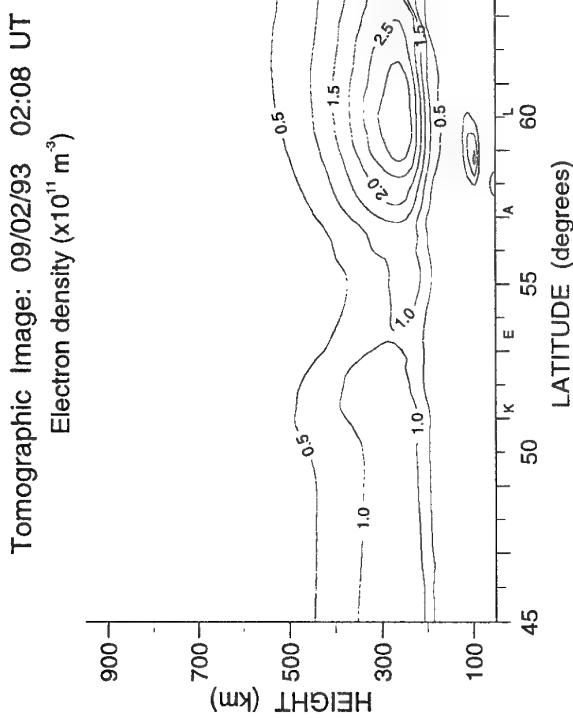
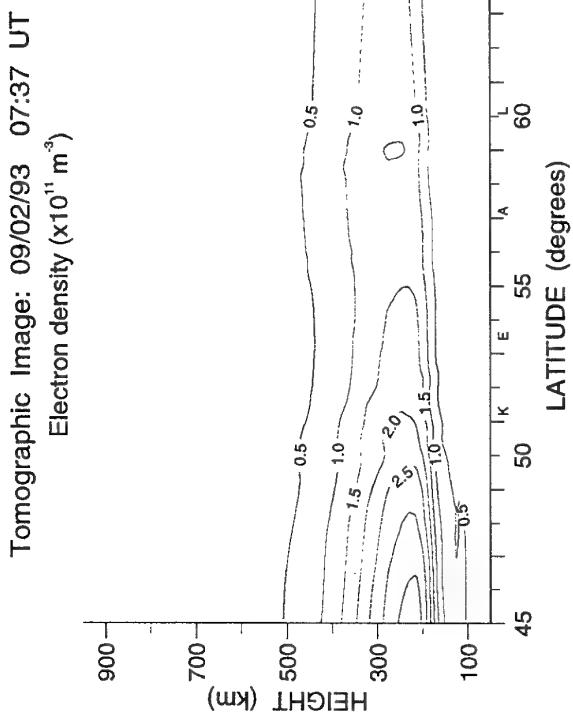
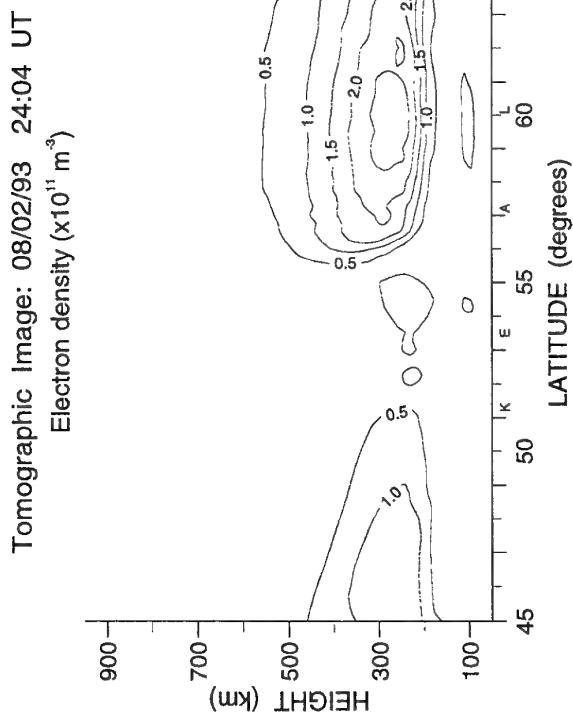


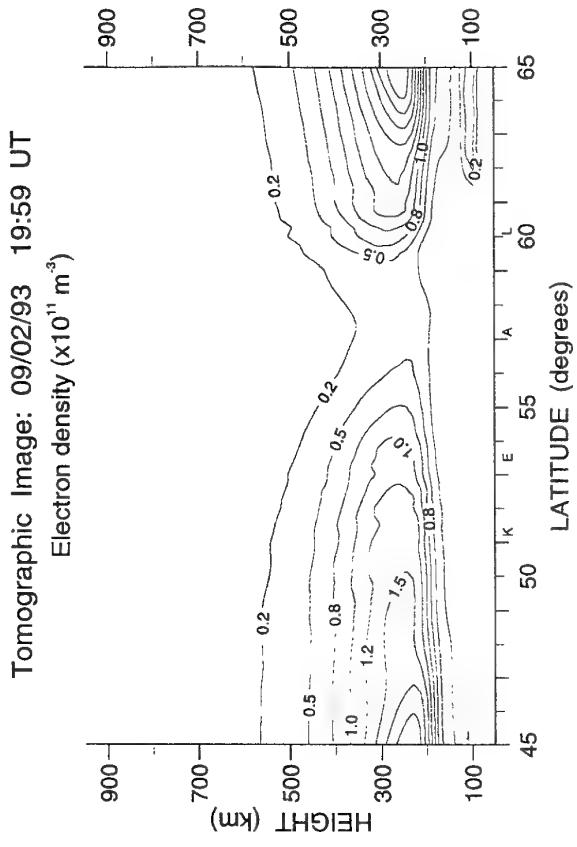
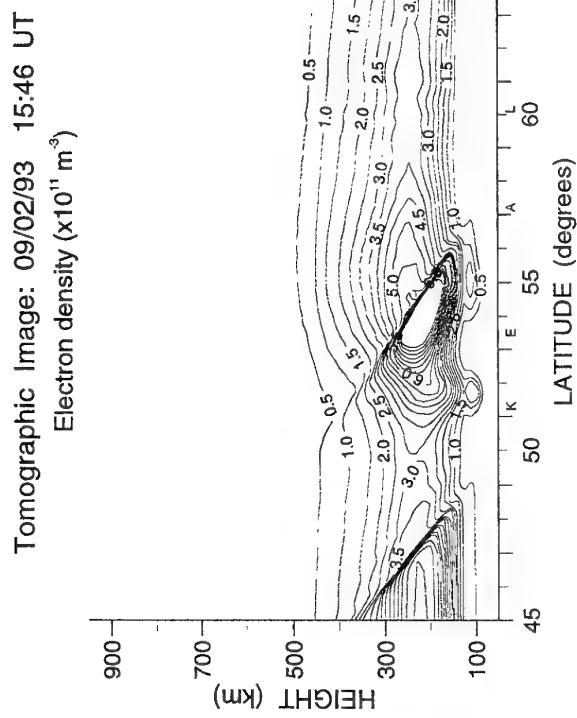
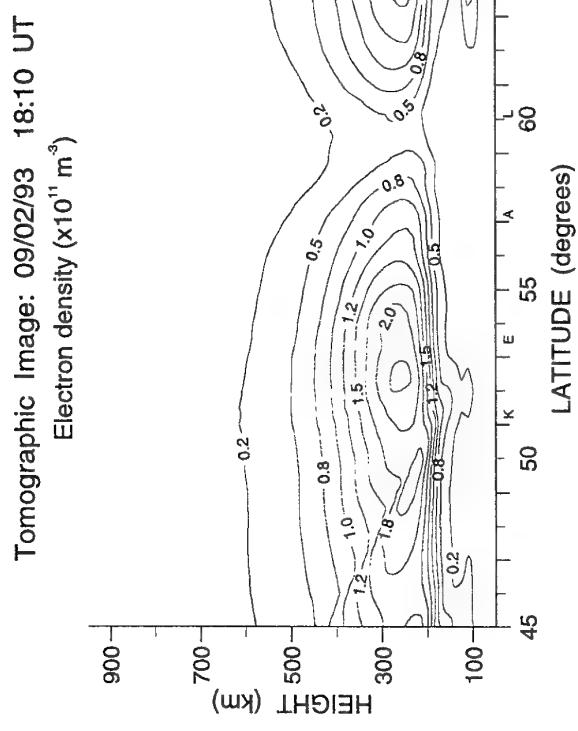
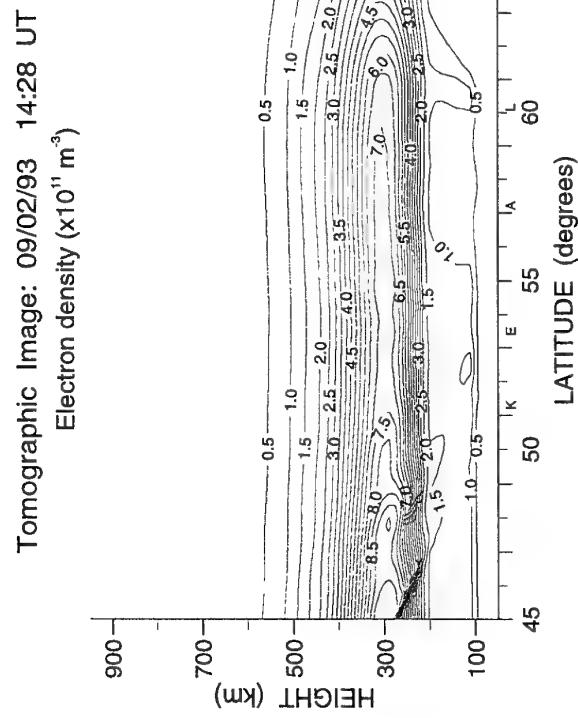




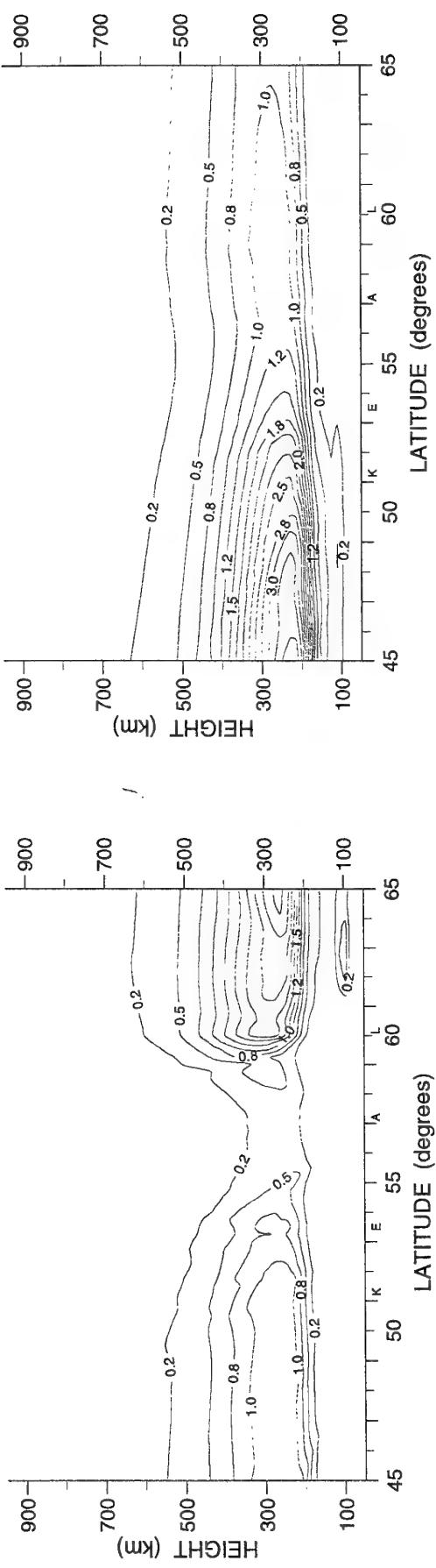




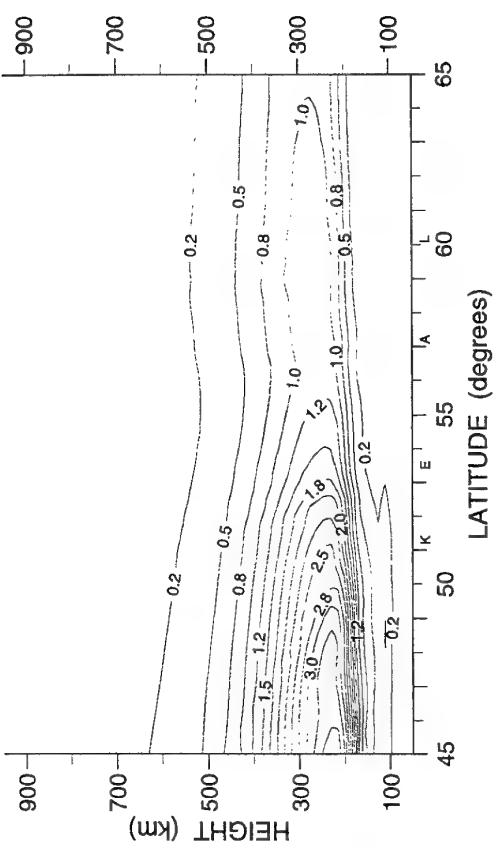




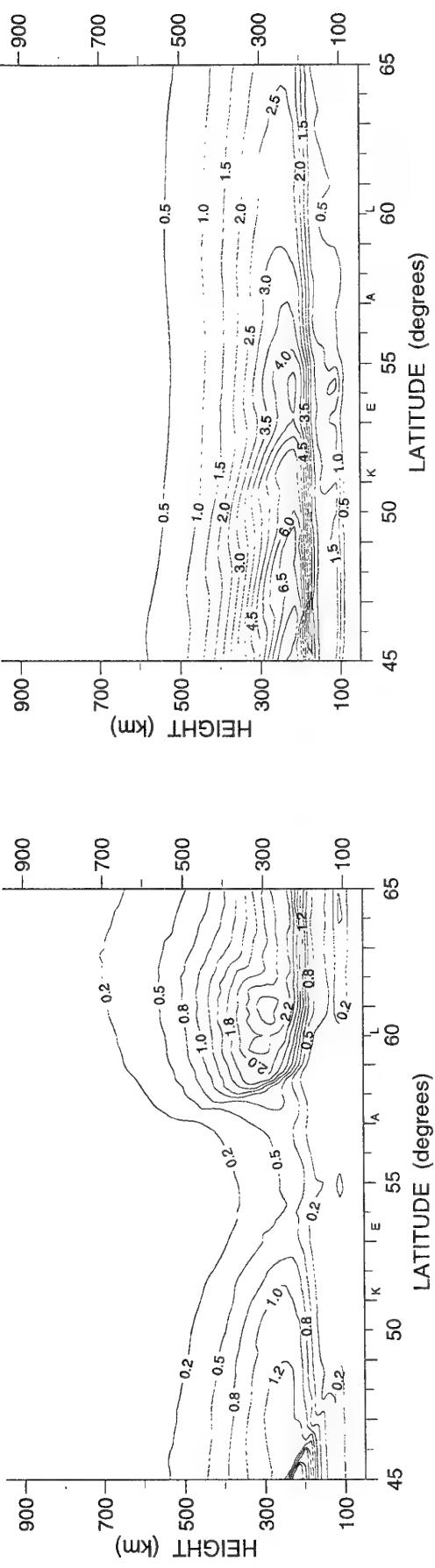
Tomographic Image: 09/02/93 21:20 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



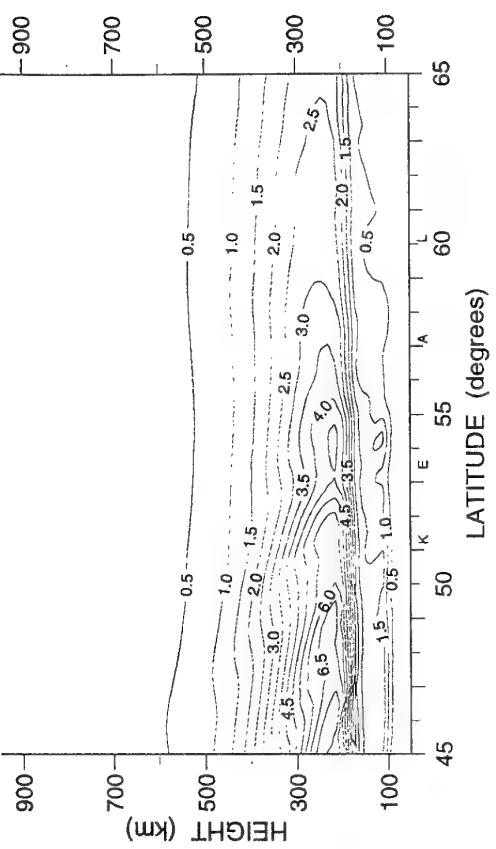
Tomographic Image: 10/02/93 07:14 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

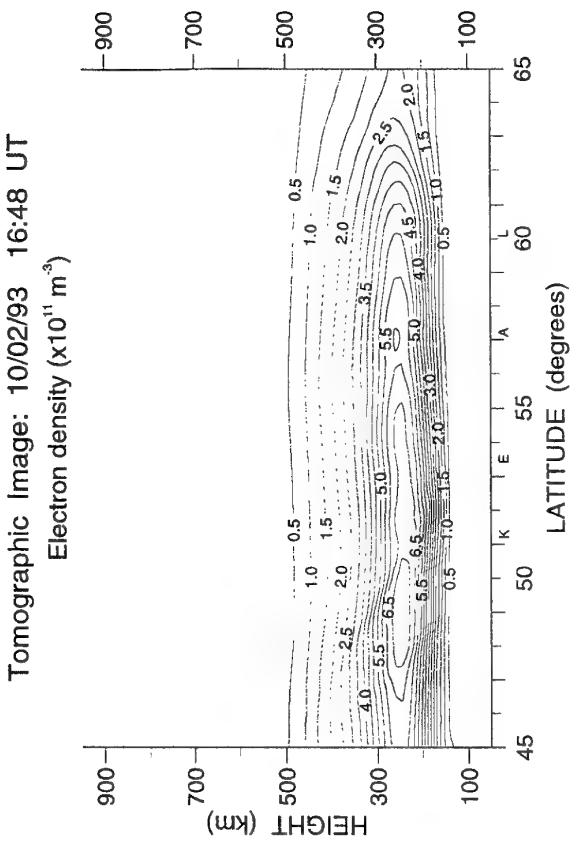
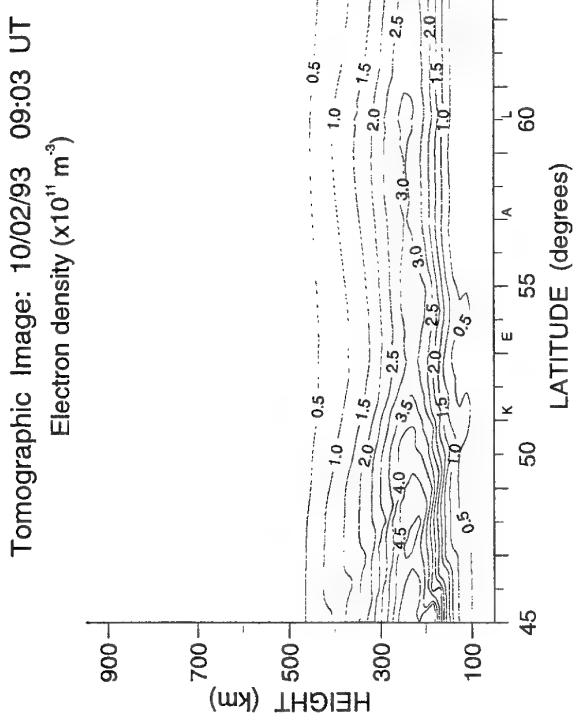
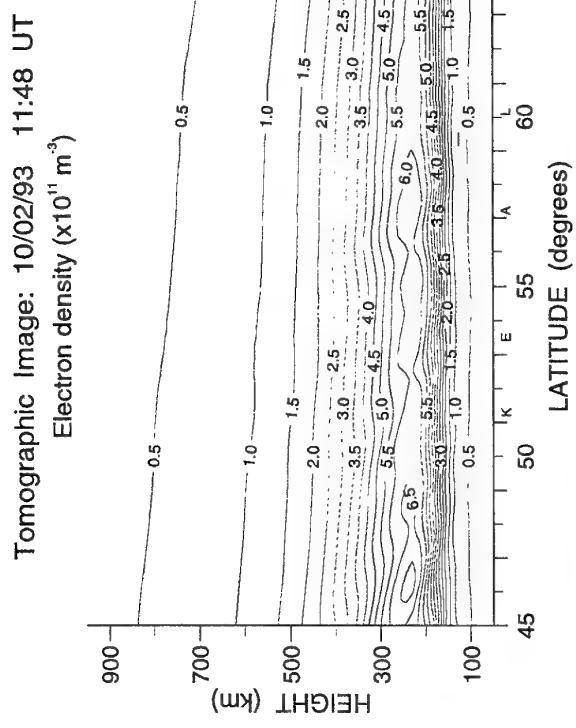
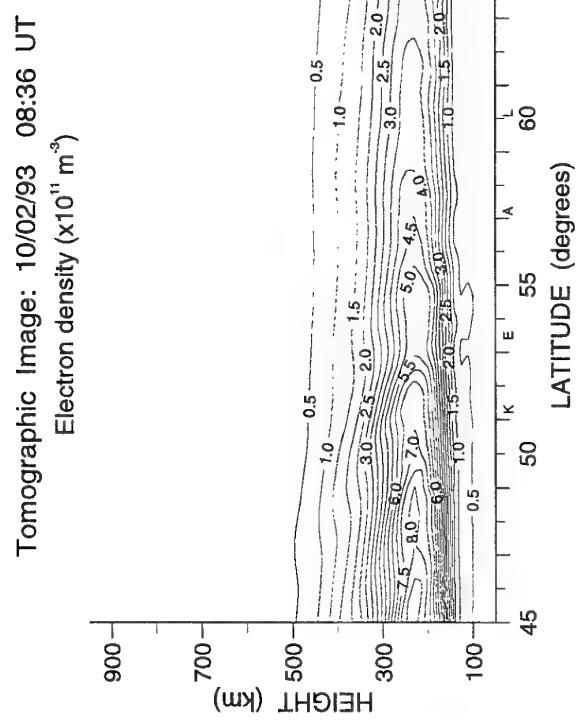


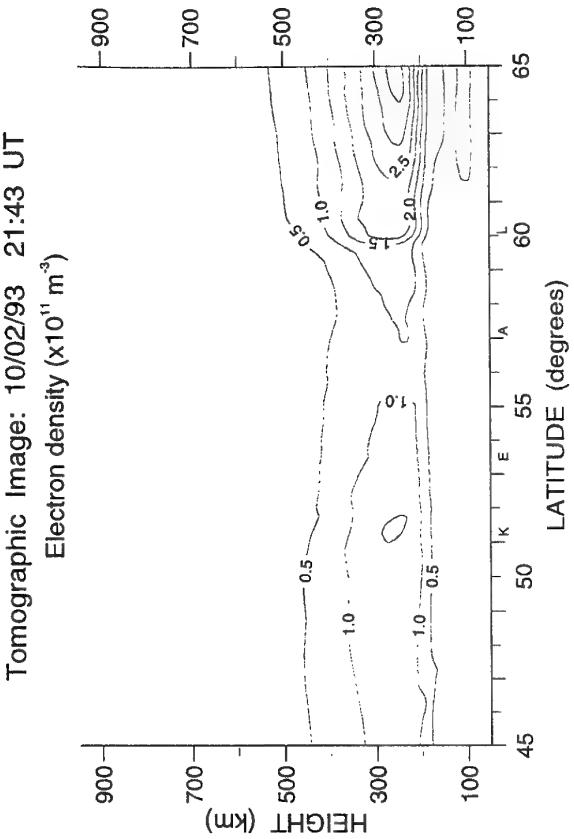
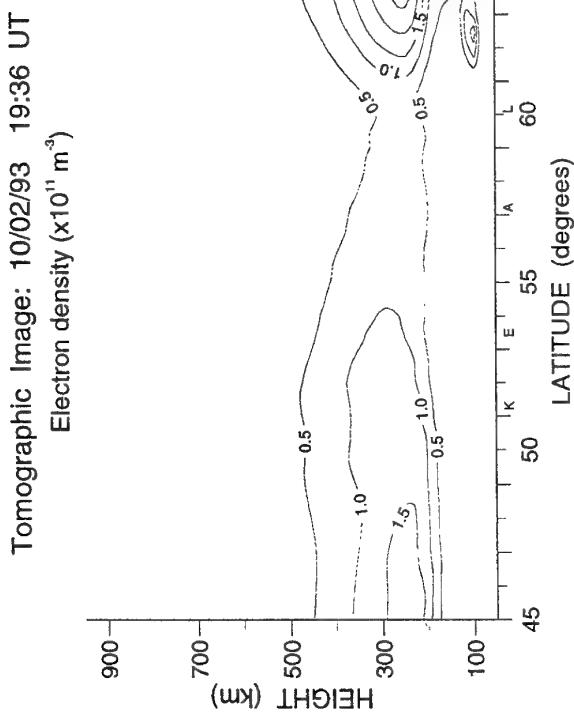
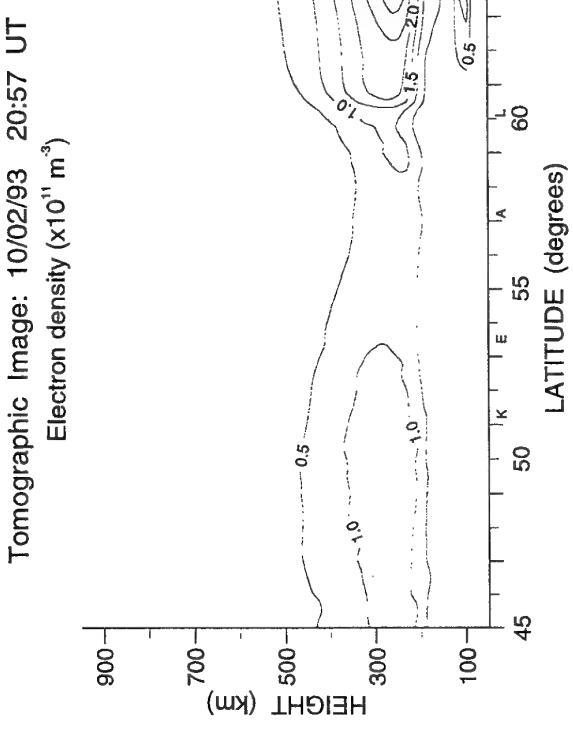
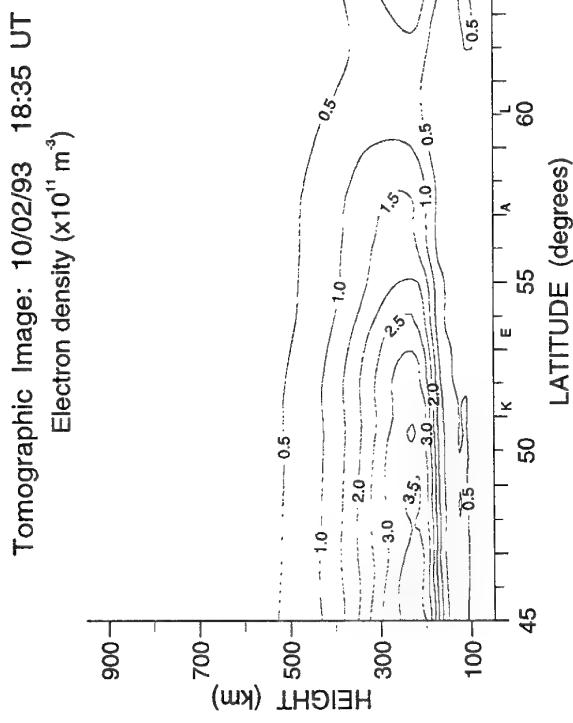
Tomographic Image: 09/02/93 23:09 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

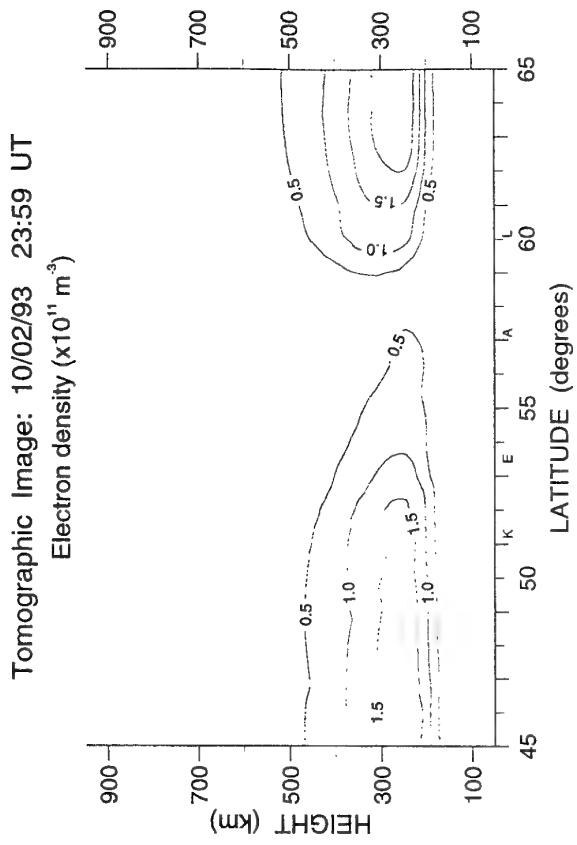
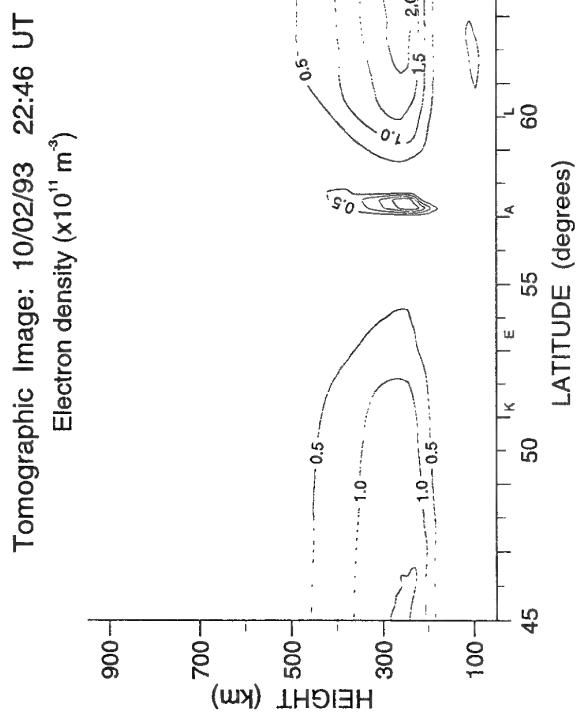
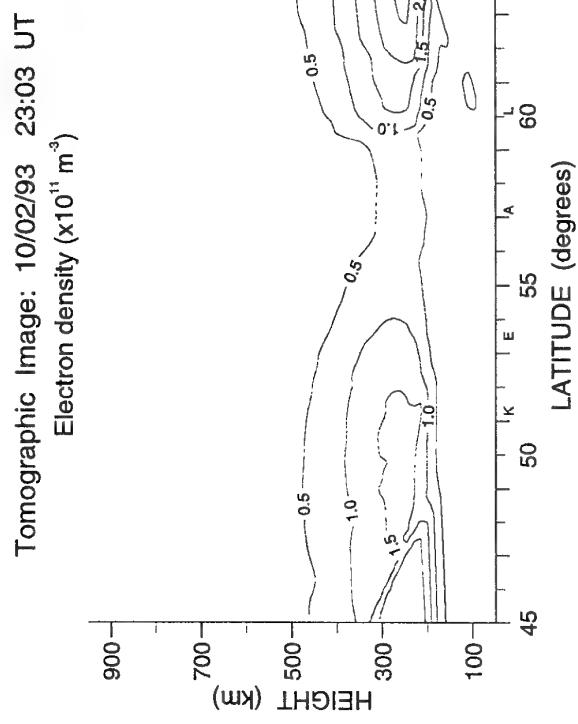
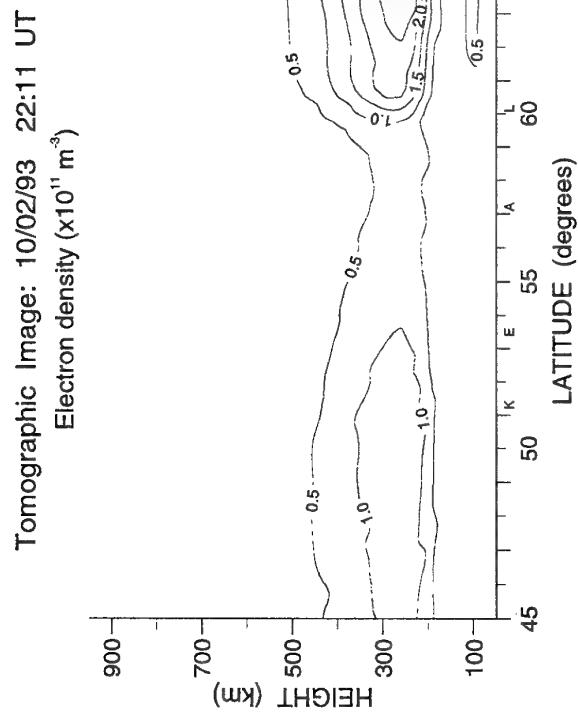


Tomographic Image: 10/02/93 08:36 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

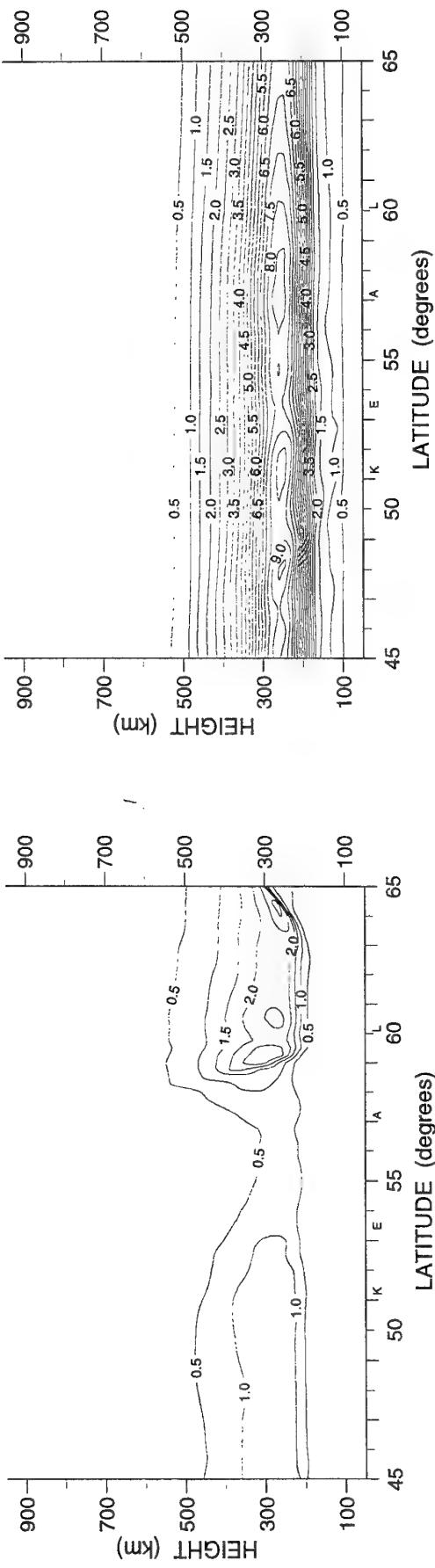




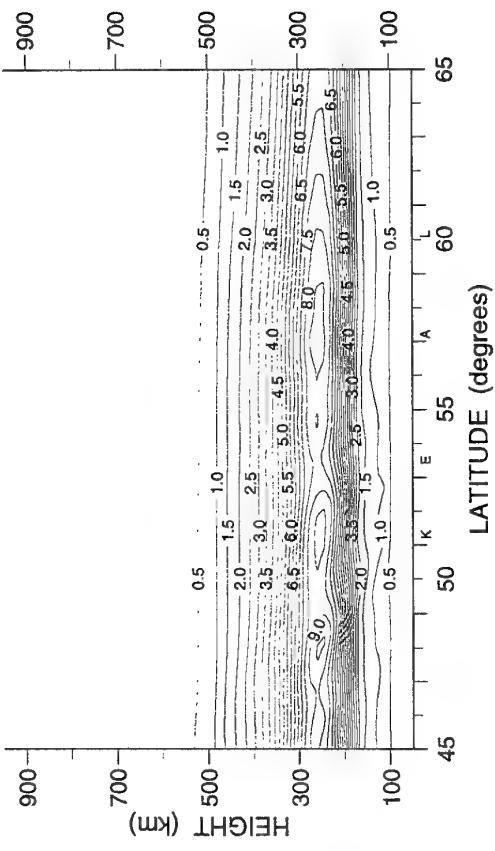




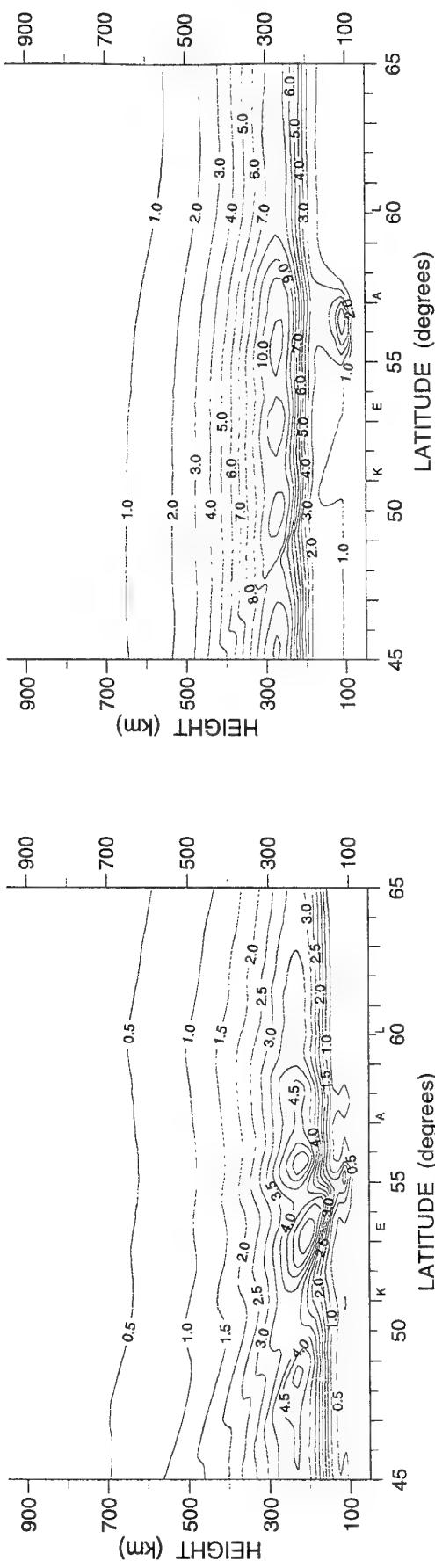
Tomographic Image: 11/02/93 03:01 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



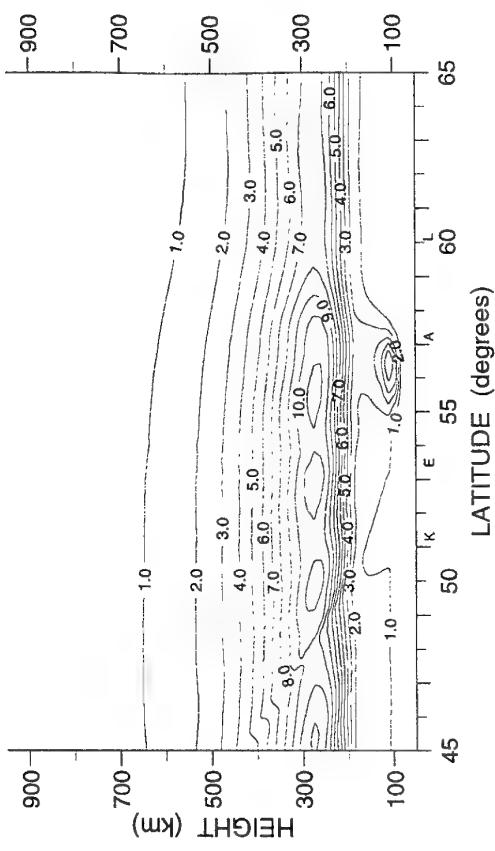
Tomographic Image: 11/02/93 10:02 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



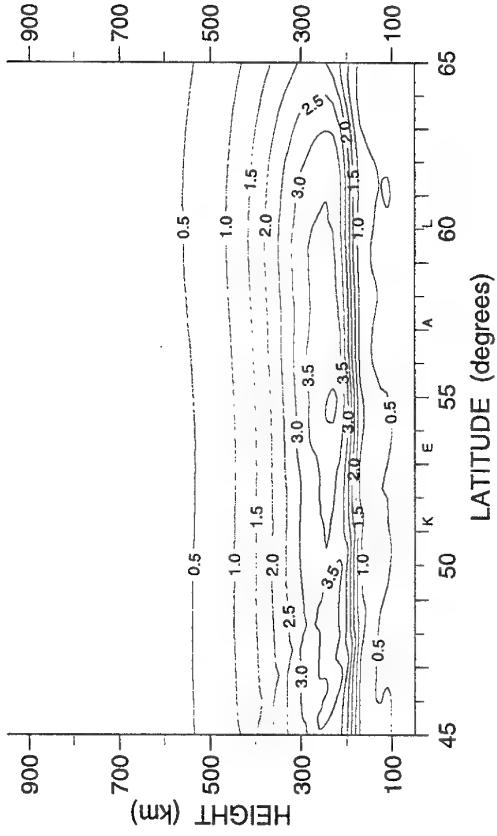
Tomographic Image: 11/02/93 08:13 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



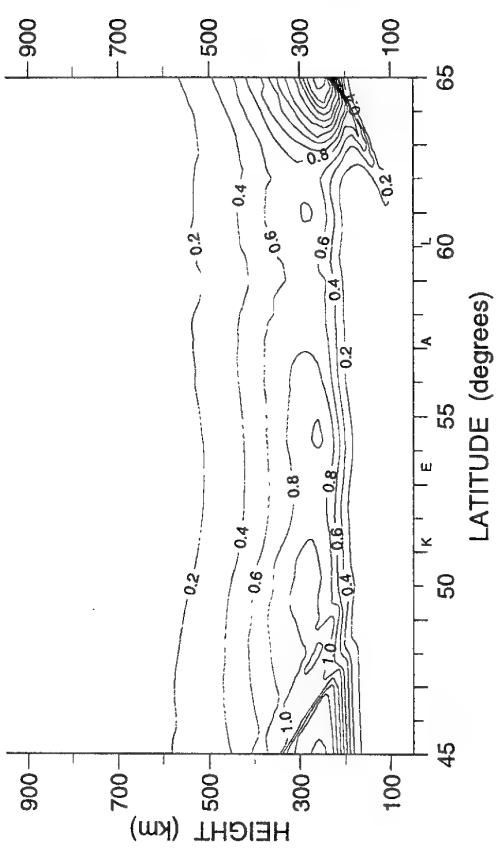
Tomographic Image: 11/02/93 11:04 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



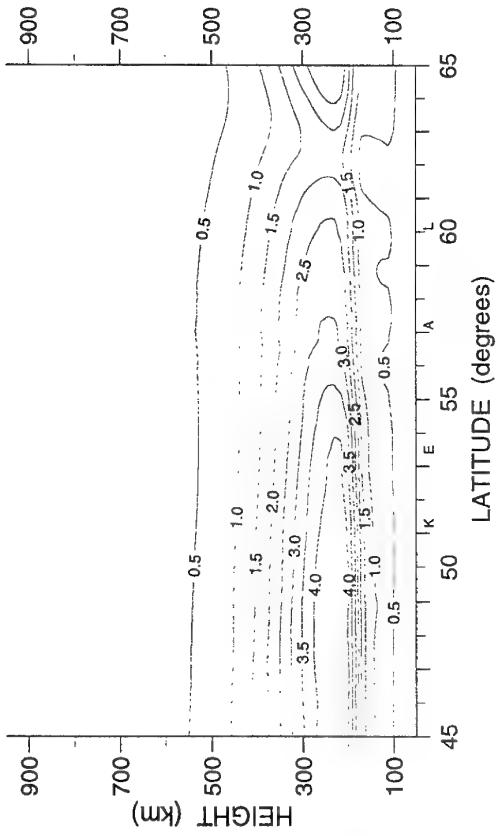
Tomographic Image: 14/02/93 18:03 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



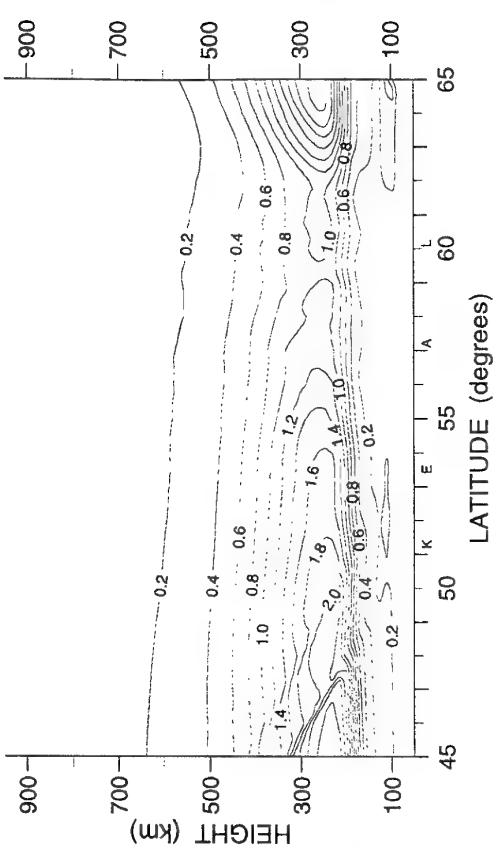
Tomographic Image: 14/02/93 20:31 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



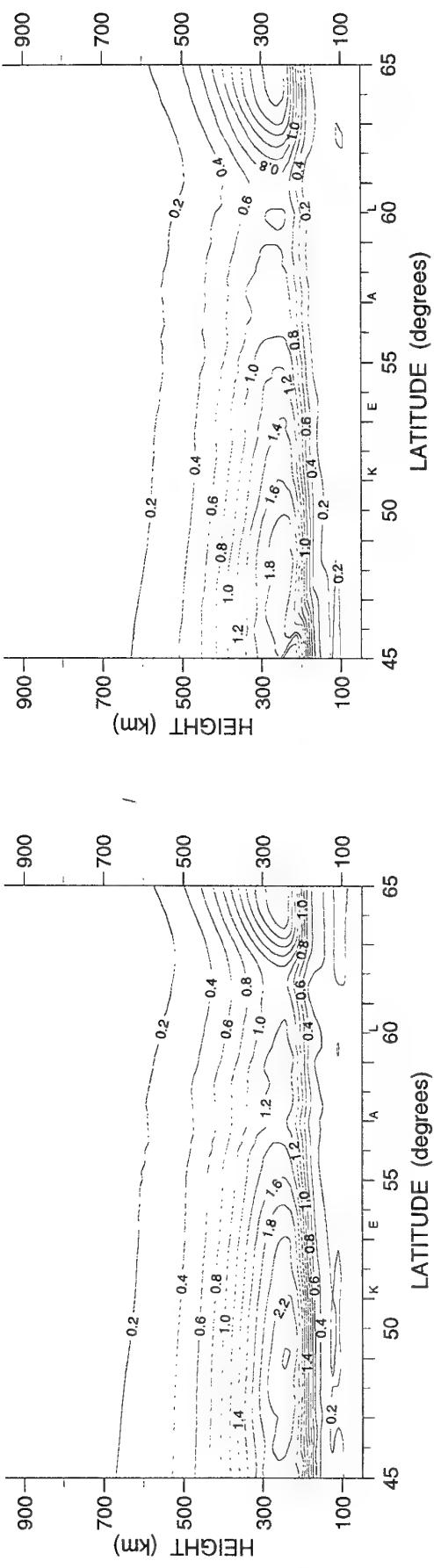
Tomographic Image: 14/02/93 19:52 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



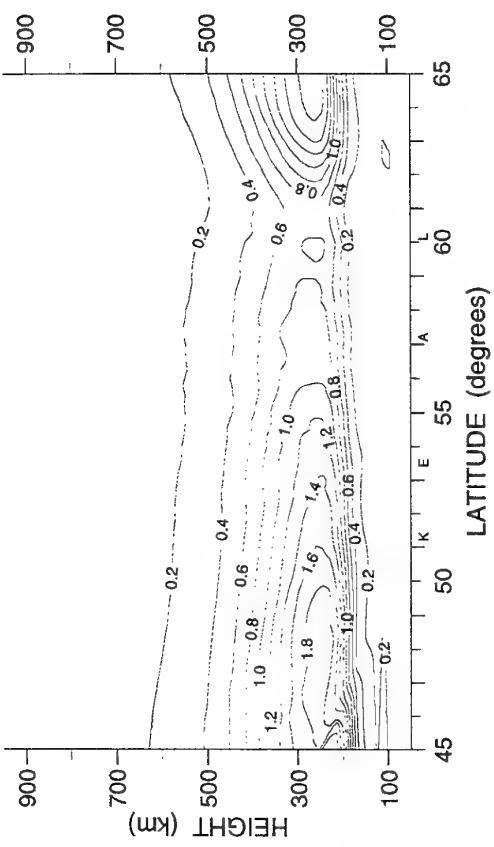
Tomographic Image: 14/02/93 21:59 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



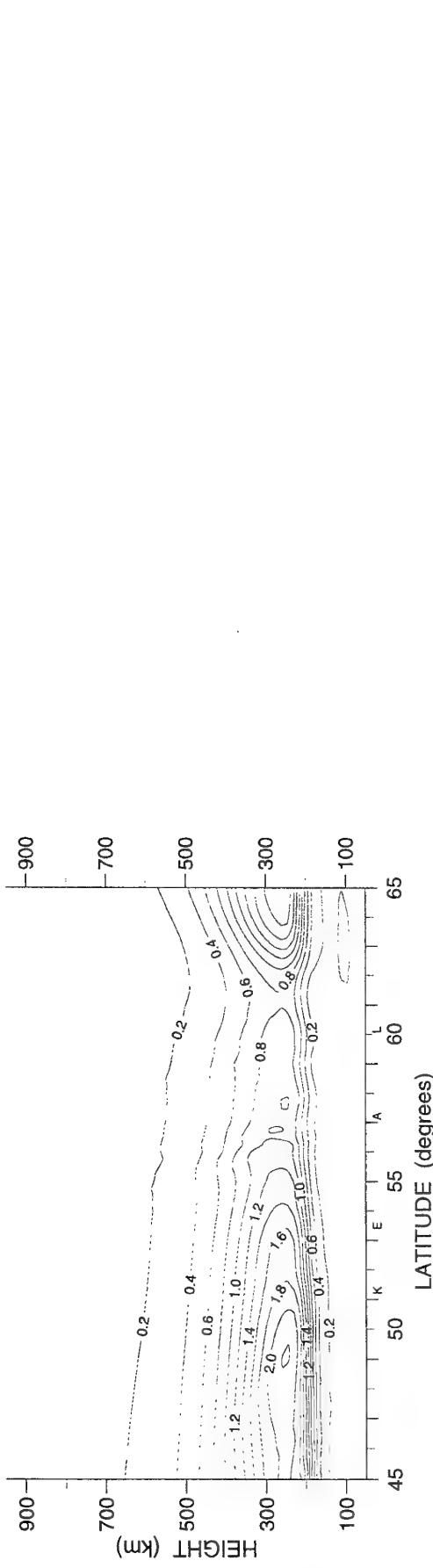
Tomographic Image: 14/02/93 22:17 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



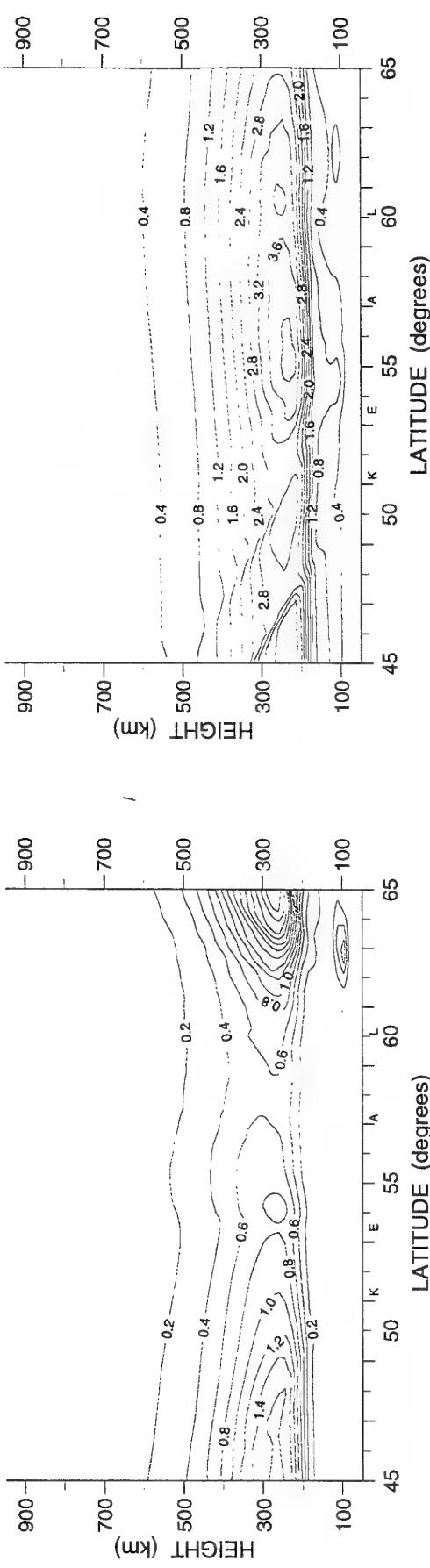
Tomographic Image: 14/02/93 23:46 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



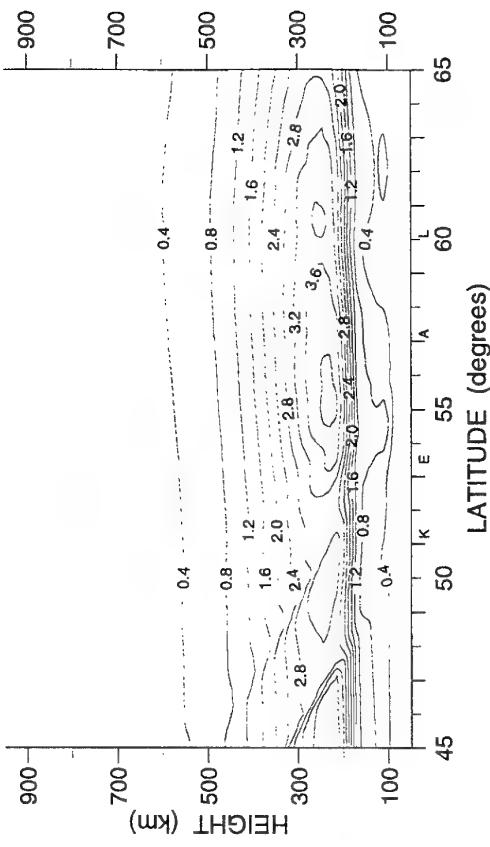
Tomographic Image: 14/02/93 22:53 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



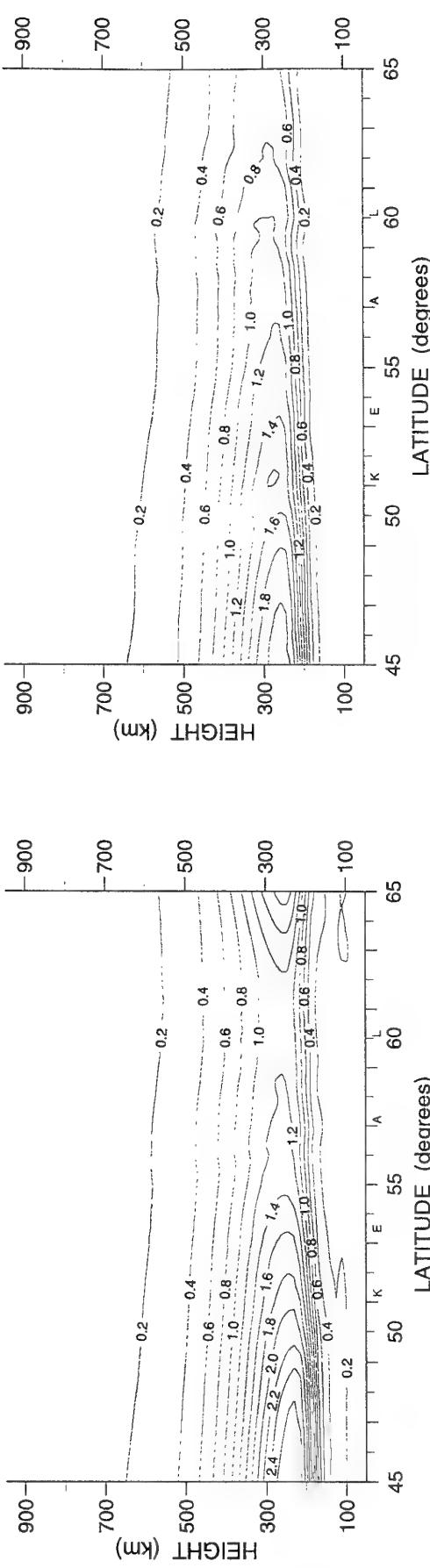
Tomographic Image: 15/02/93 04:27 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



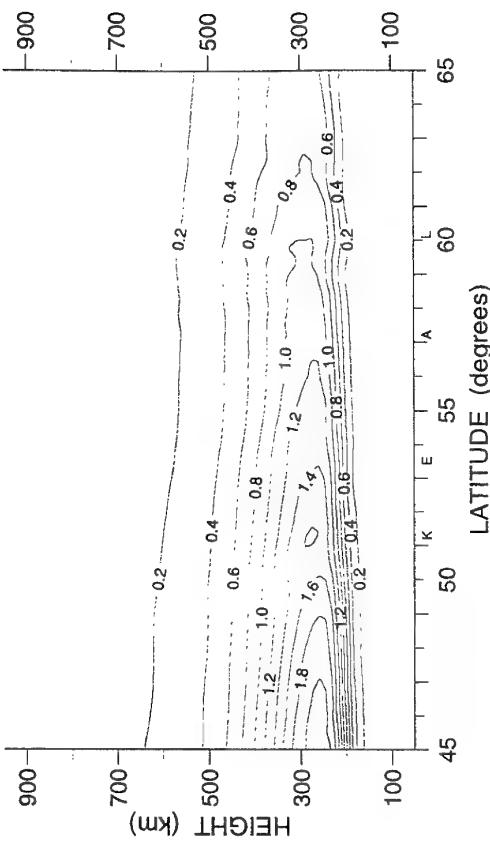
Tomographic Image: 15/02/93 17:40 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



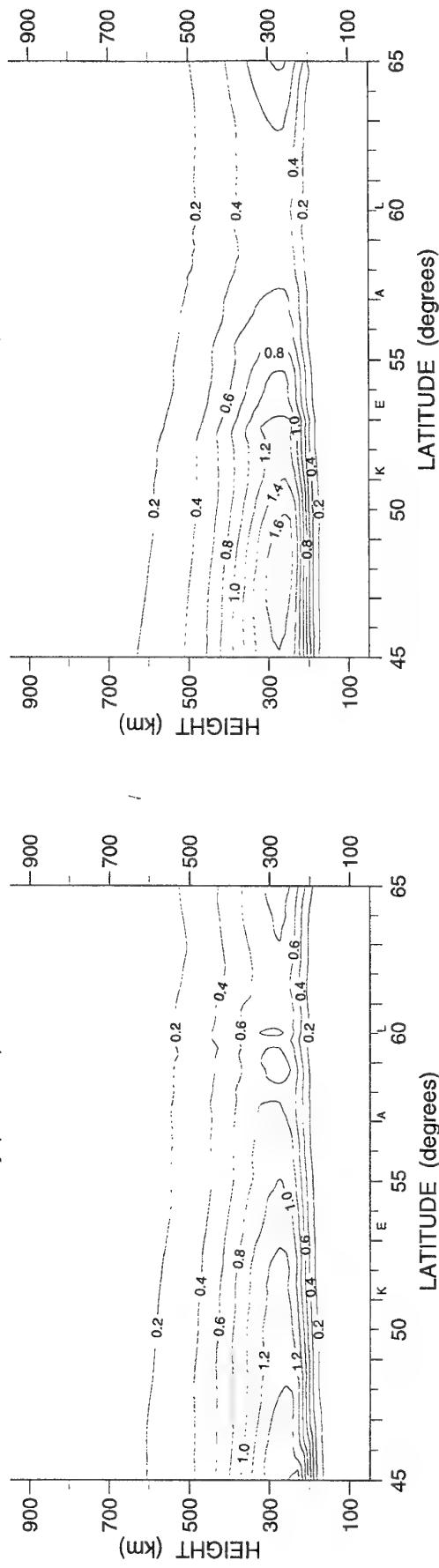
Tomographic Image: 15/02/93 07:08 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



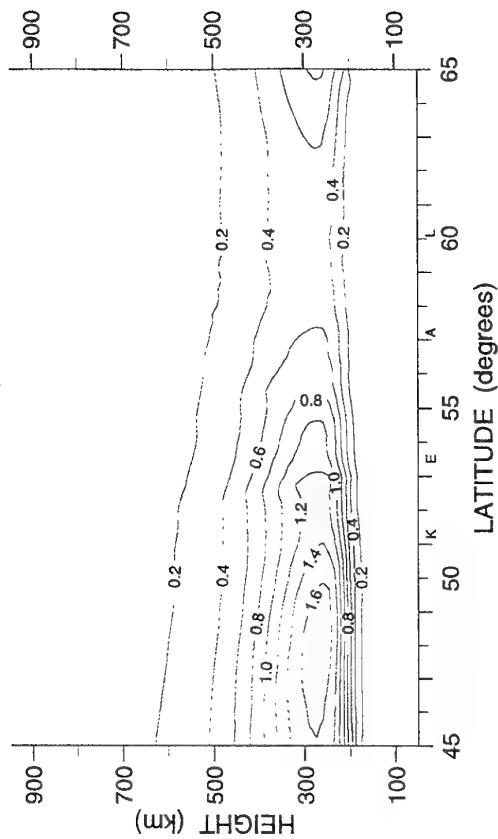
Tomographic Image: 15/02/93 20:51 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



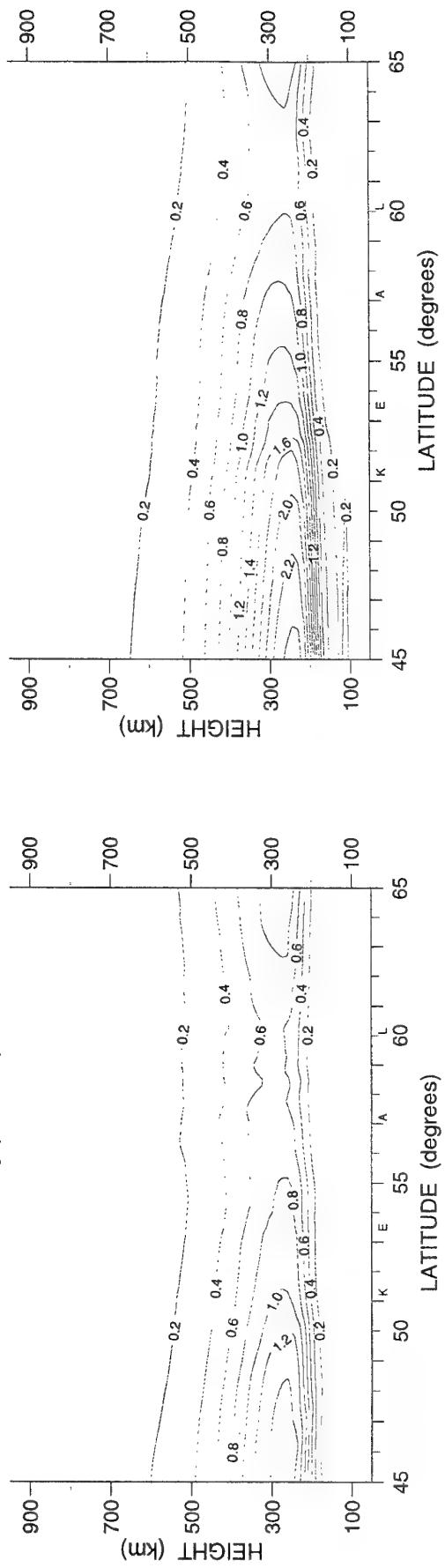
Tomographic Image: 15/02/93 22:10 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



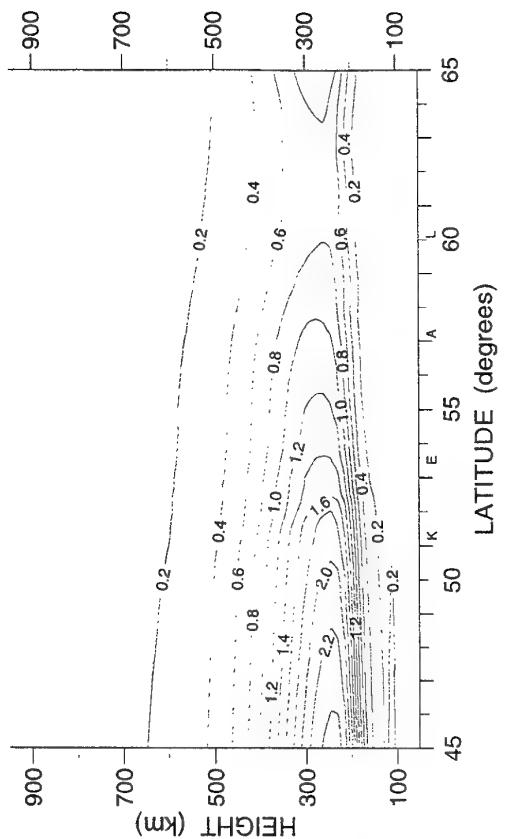
Tomographic Image: 16/02/93 02:31 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



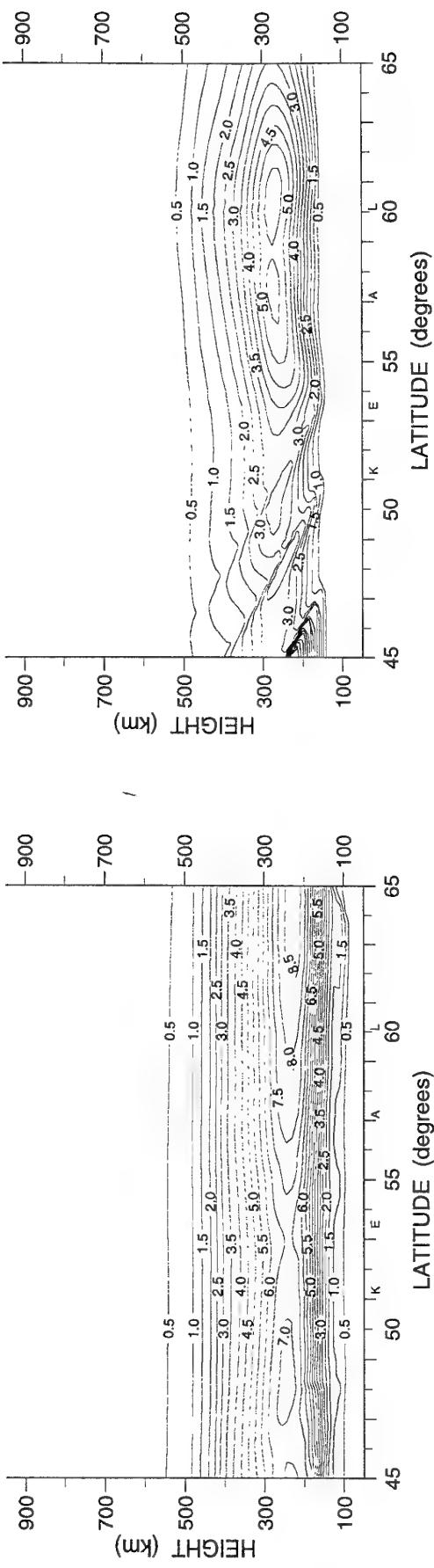
Tomographic Image: 15/02/93 23:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



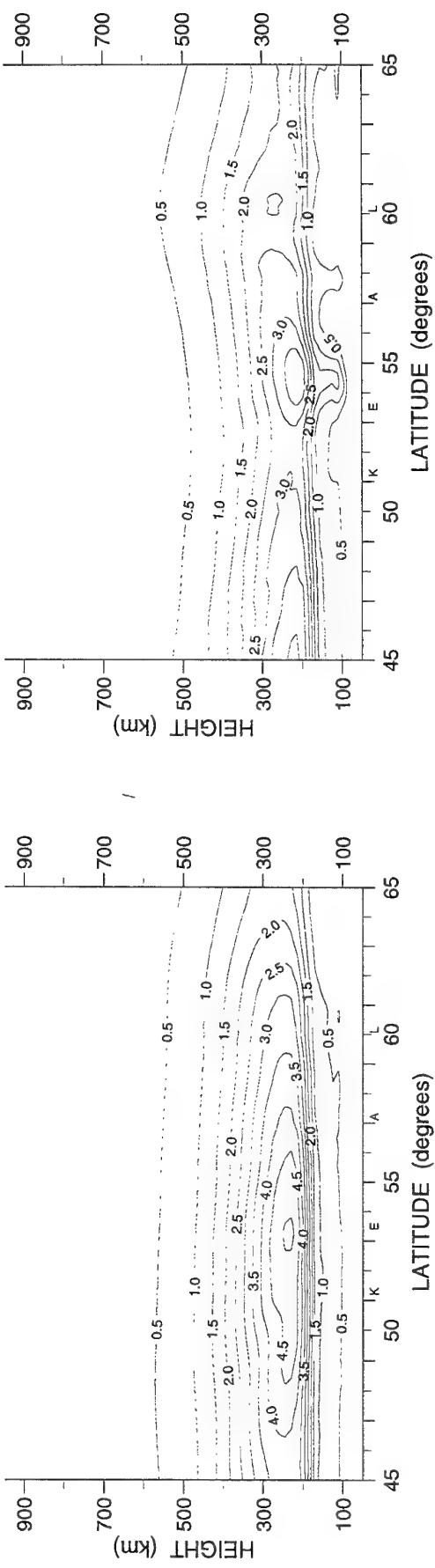
Tomographic Image: 16/02/93 06:45 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



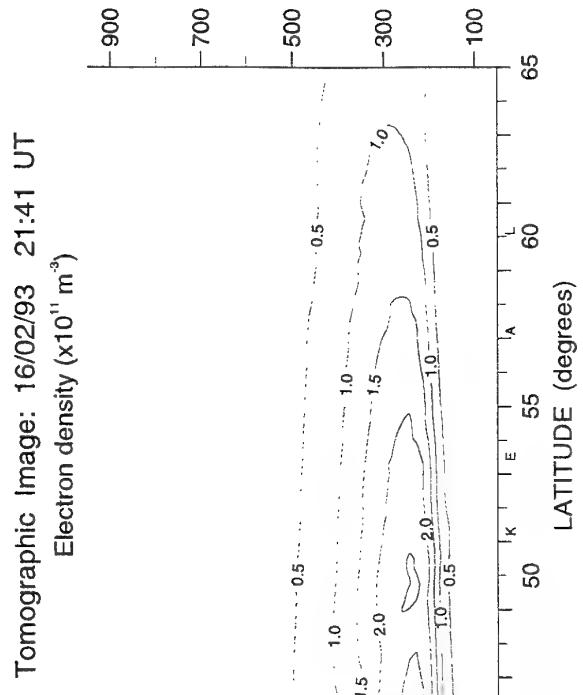
Tomographic Image: 16/02/93 11:03 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



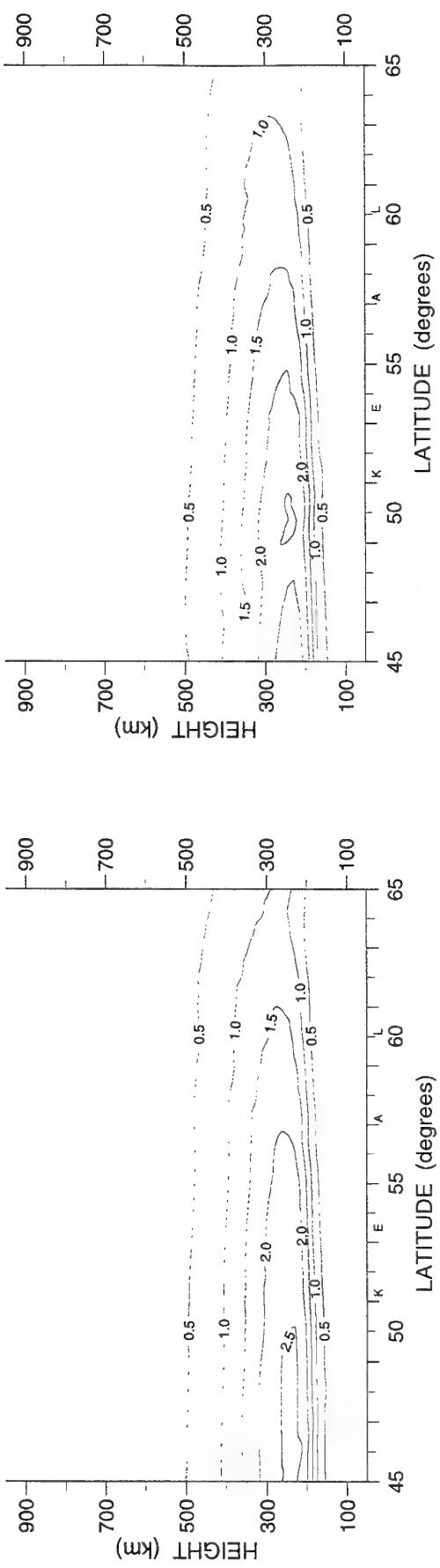
Tomographic Image: 16/02/93 19:06 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



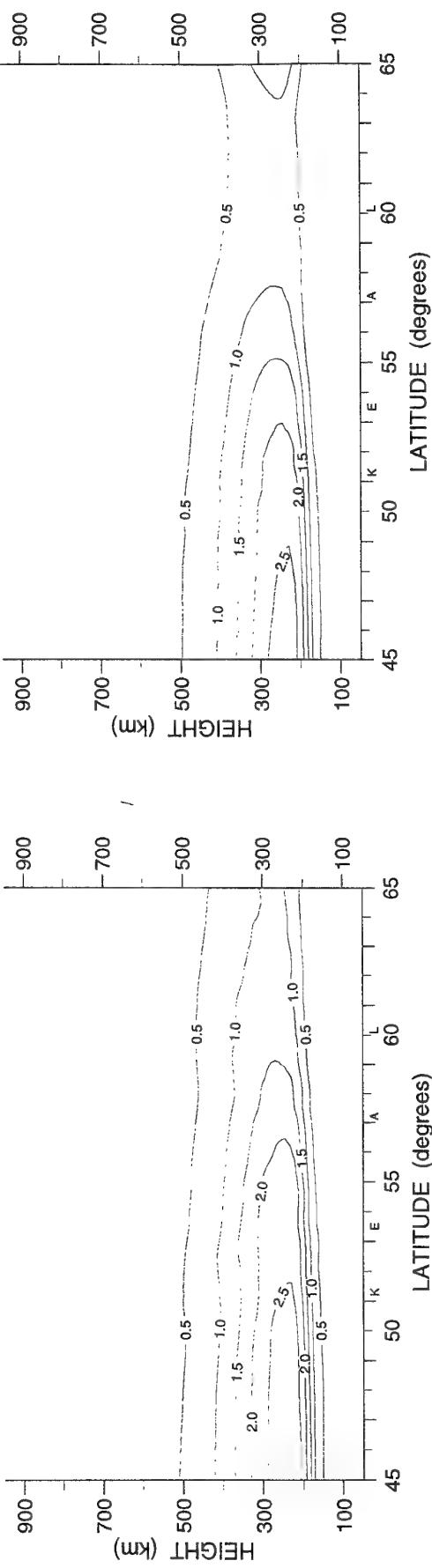
Tomographic Image: 16/02/93 20:55 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



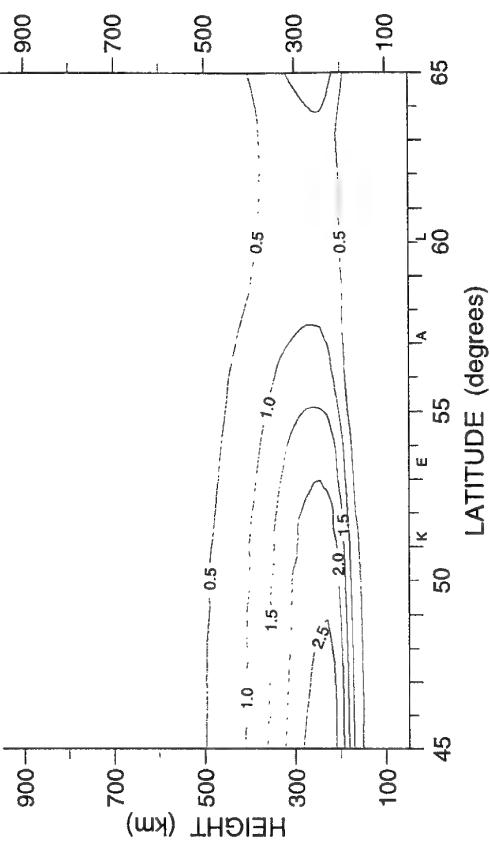
Tomographic Image: 16/02/93 20:28 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



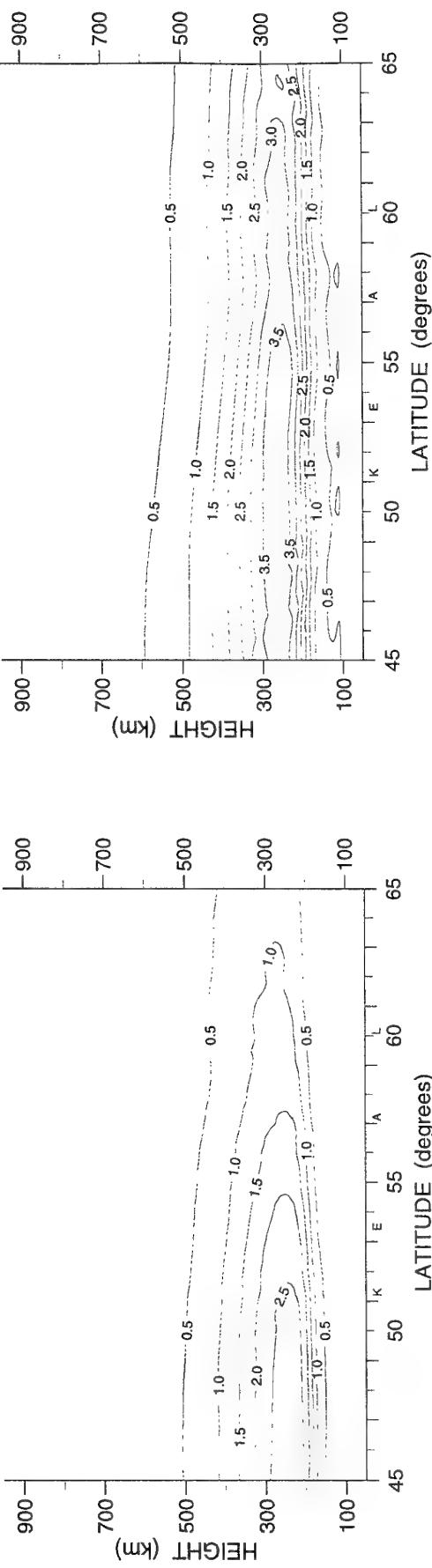
Tomographic Image: 16/02/93 22:17 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



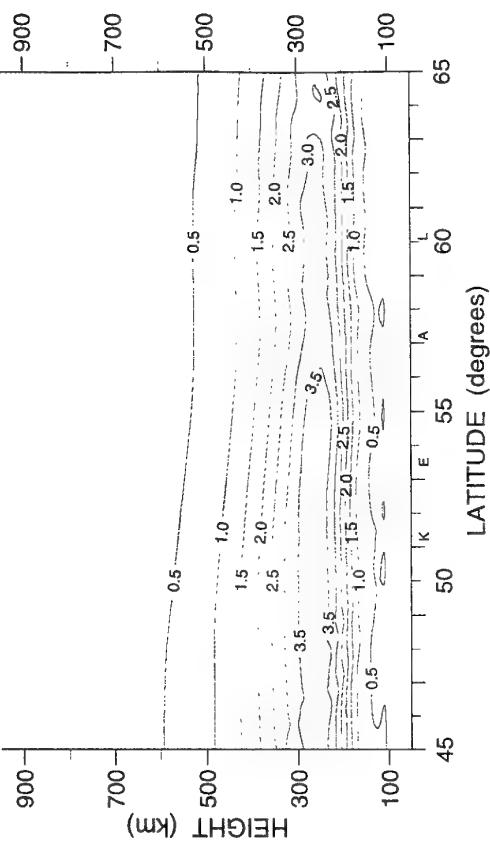
Tomographic Image: 17/02/93 06:22 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

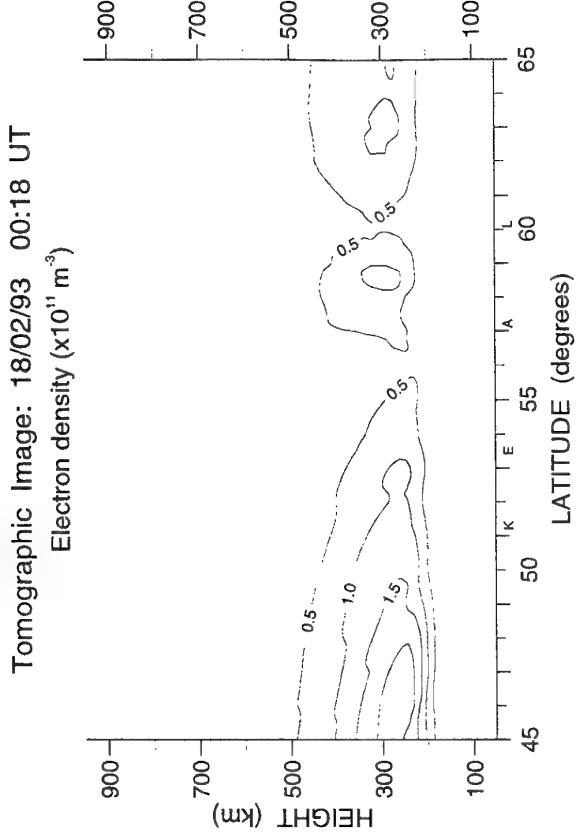
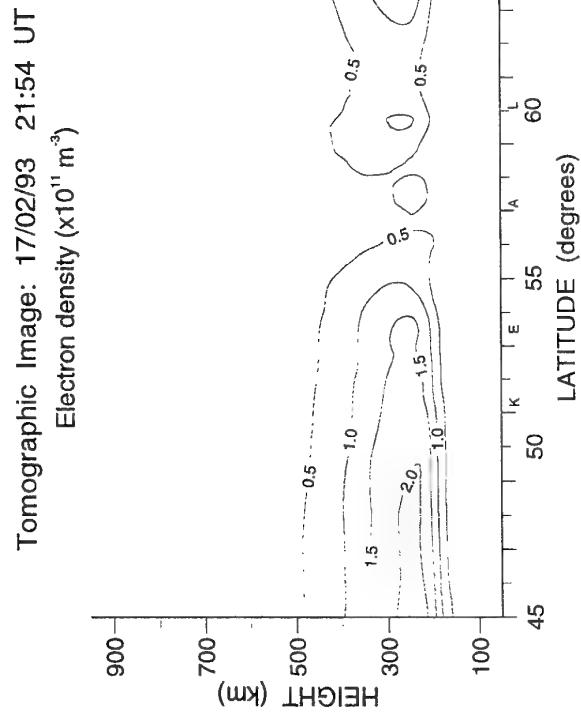
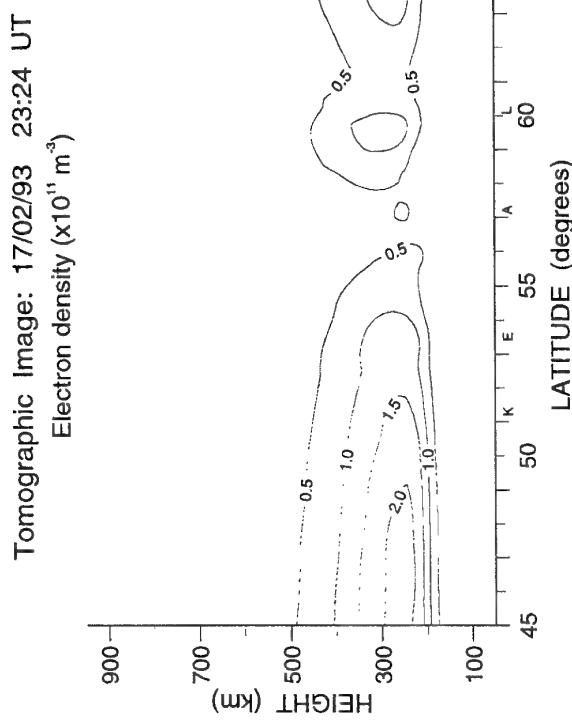
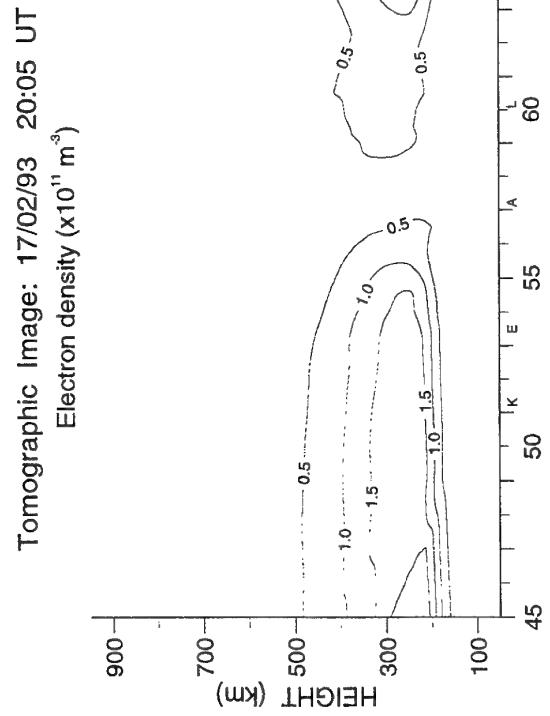


Tomographic Image: 16/02/93 23:14 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

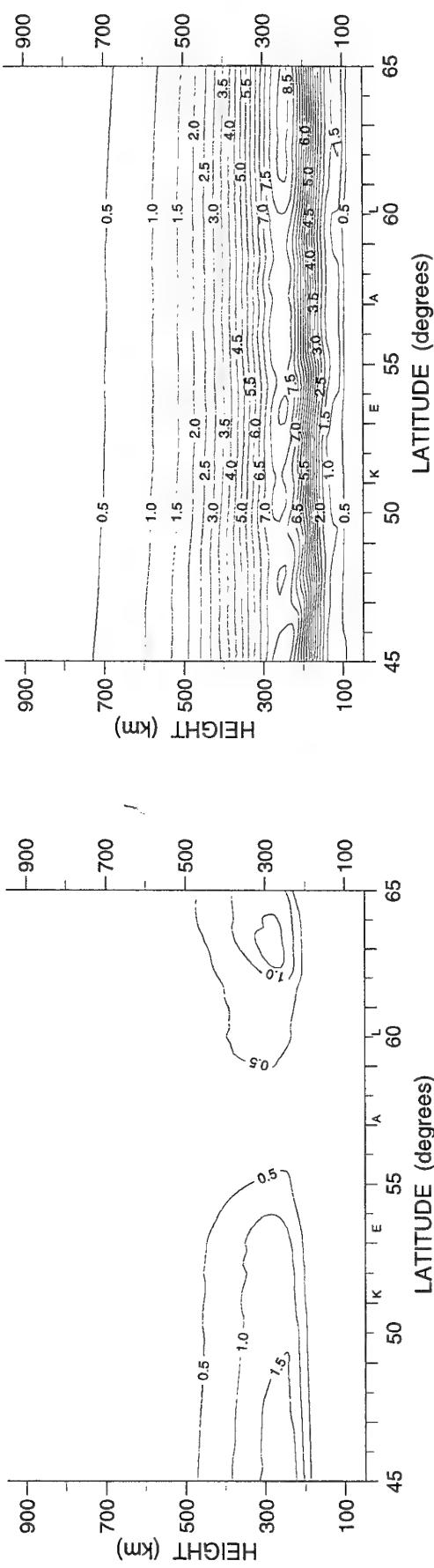


Tomographic Image: 17/02/93 08:11 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

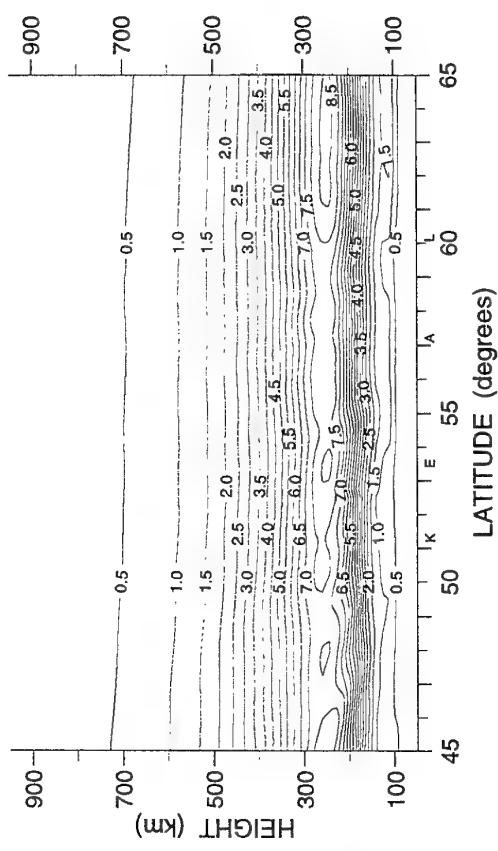




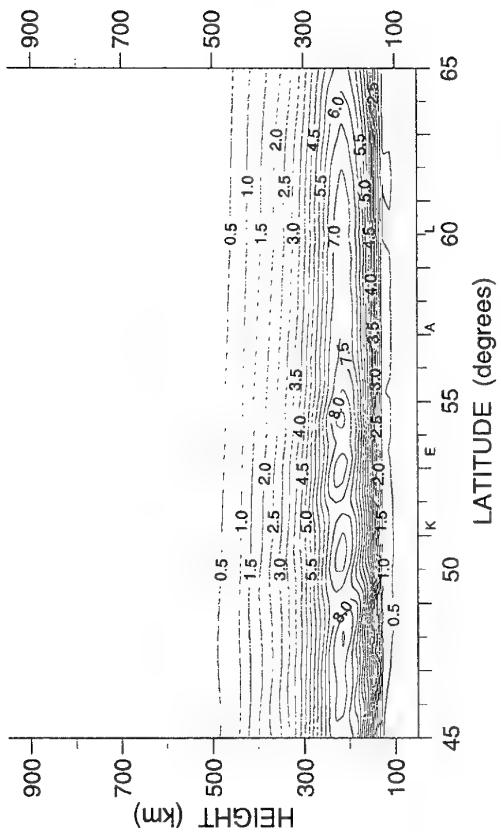
Tomographic Image: 18/02/93 01:35 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



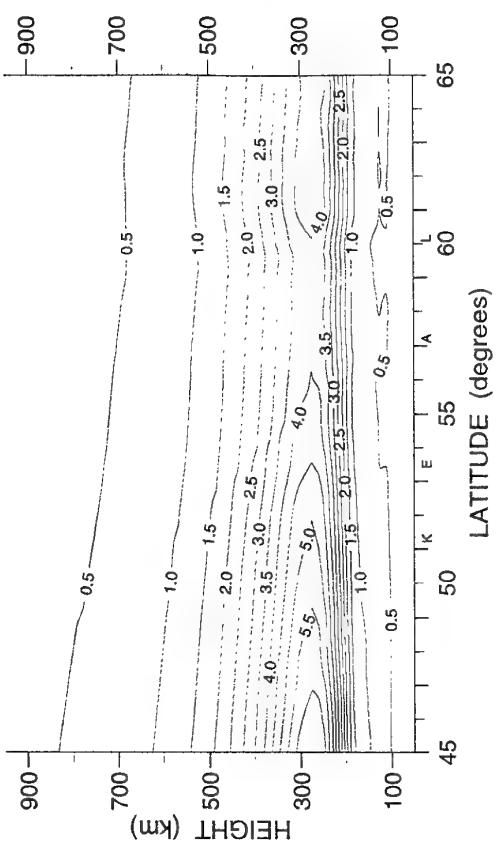
Tomographic Image: 18/02/93 11:24 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



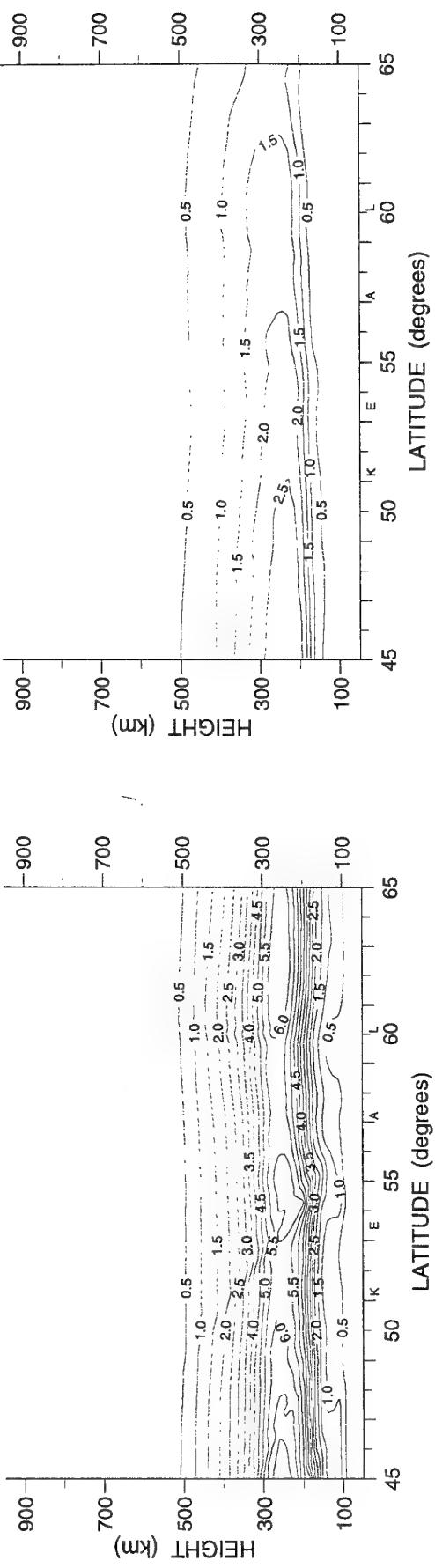
Tomographic Image: 18/02/93 09:09 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



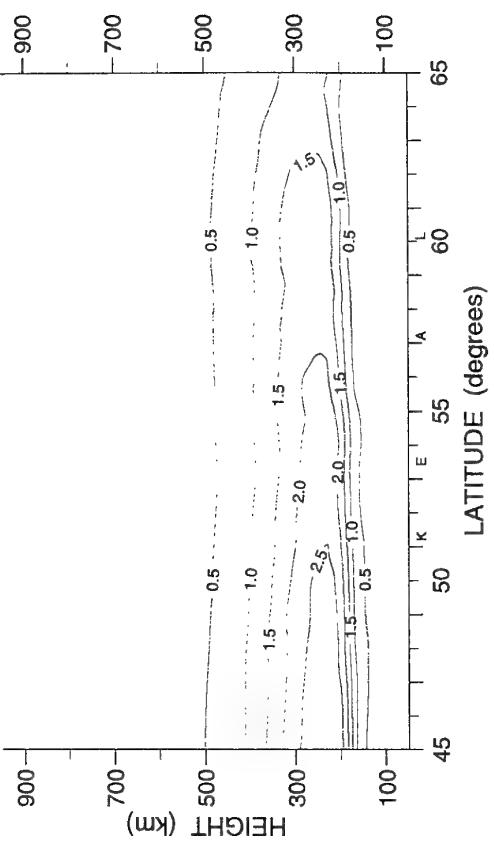
Tomographic Image: 19/02/93 08:46 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



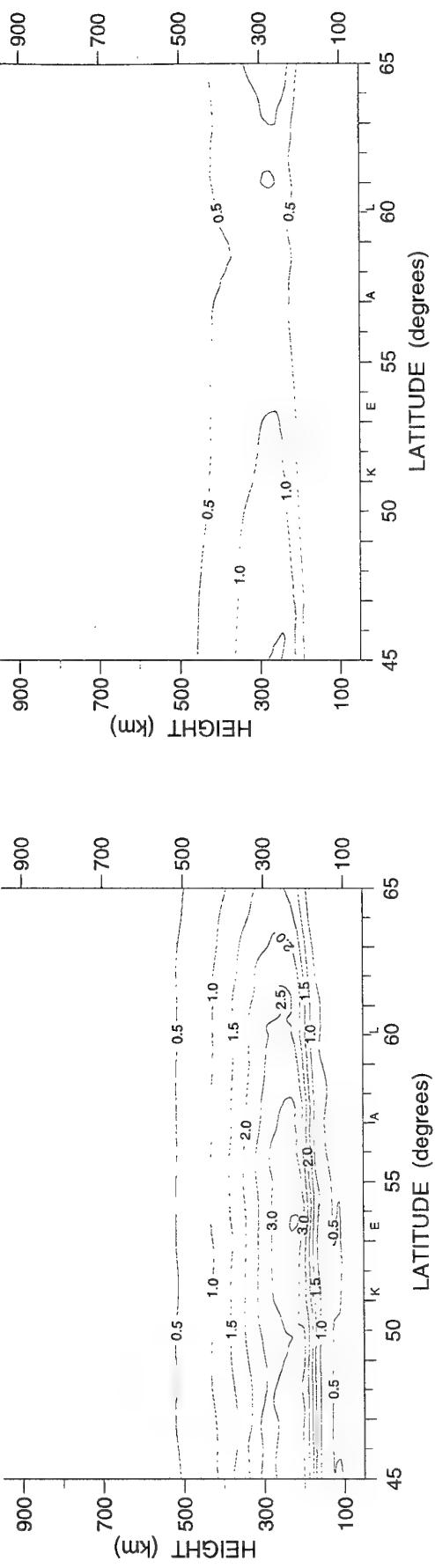
Tomographic Image: 19/02/93 11:29 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



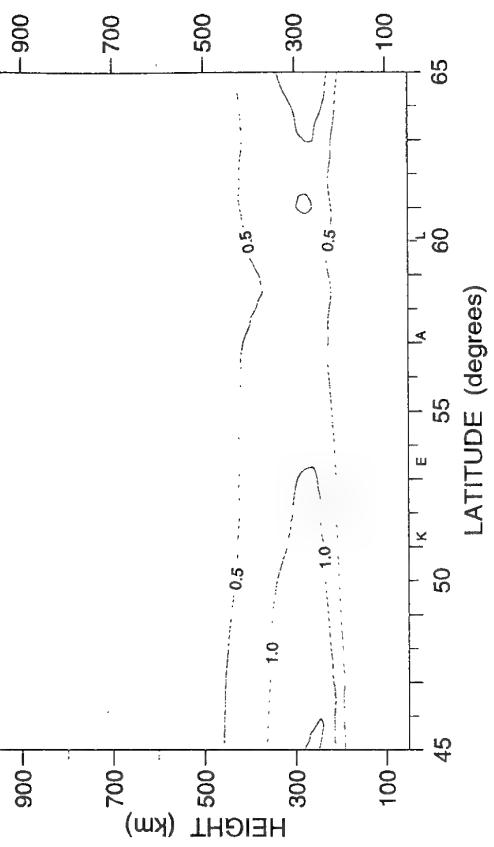
Tomographic Image: 19/02/93 19:46 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



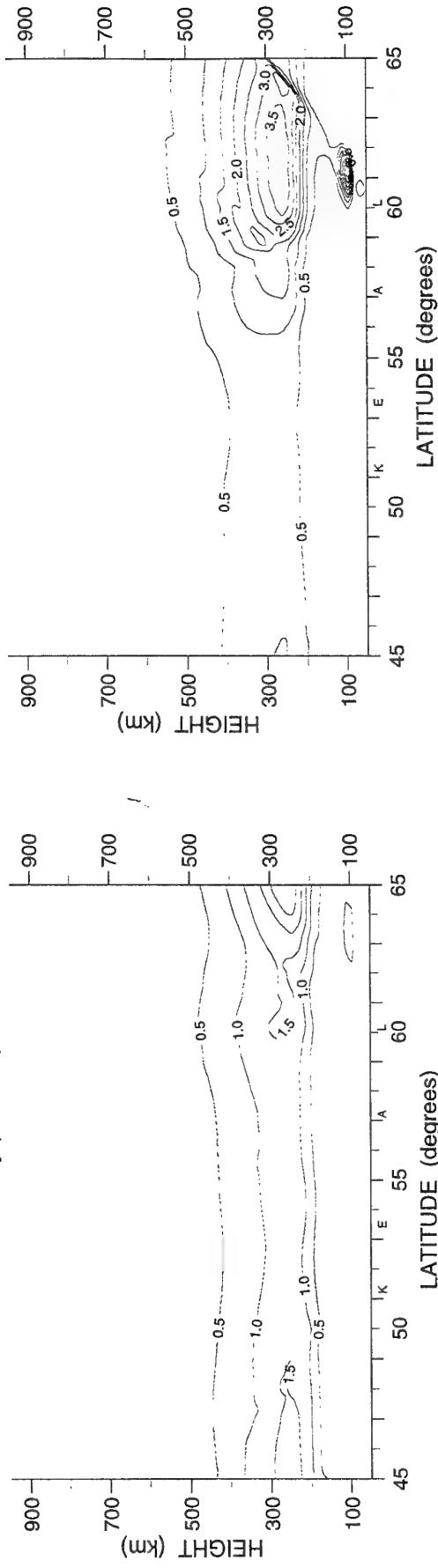
Tomographic Image: 19/02/93 17:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



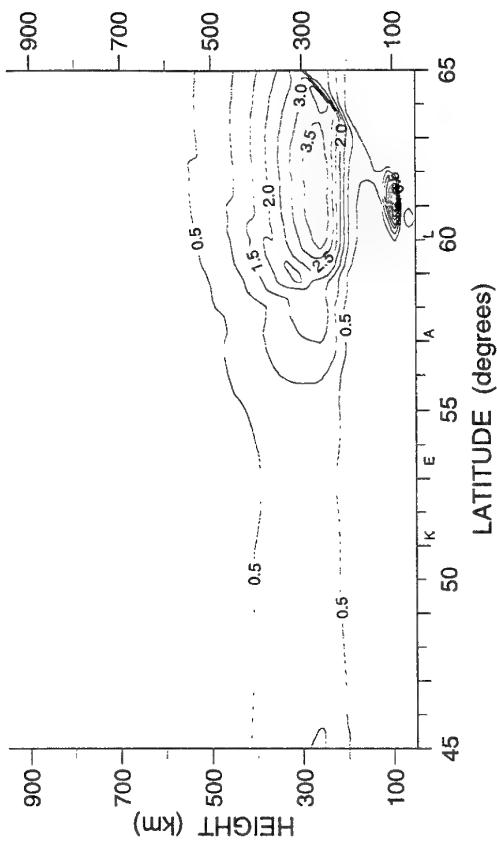
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Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



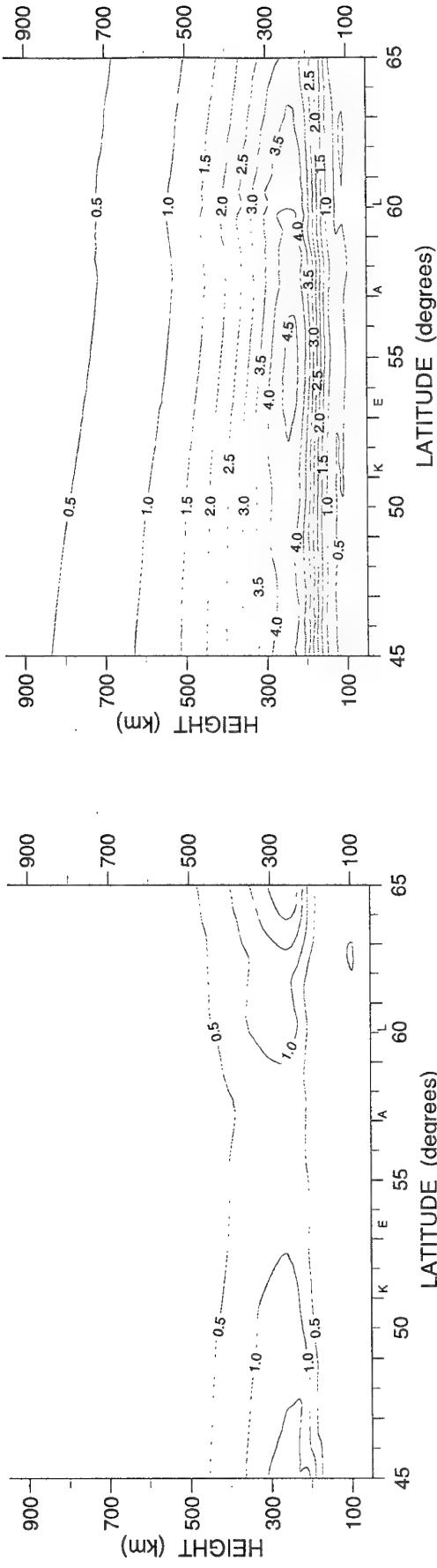
Tomographic Image: 19/02/93 23:26 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



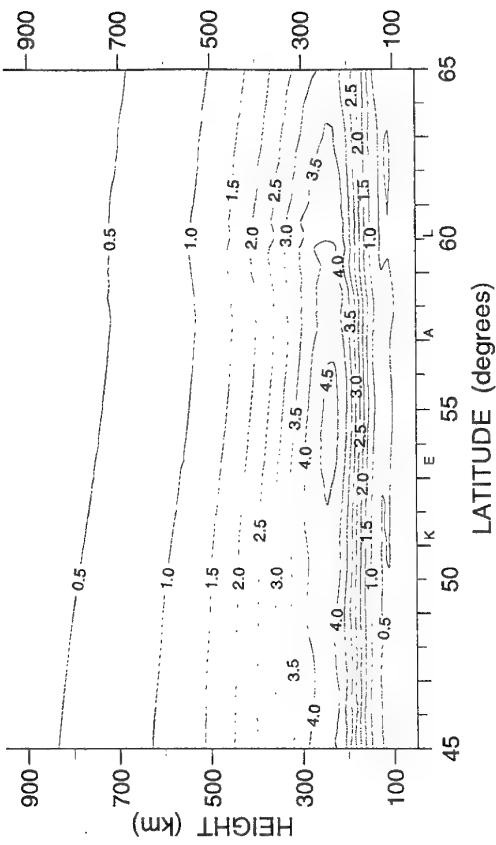
Tomographic Image: 20/02/93 06:03 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



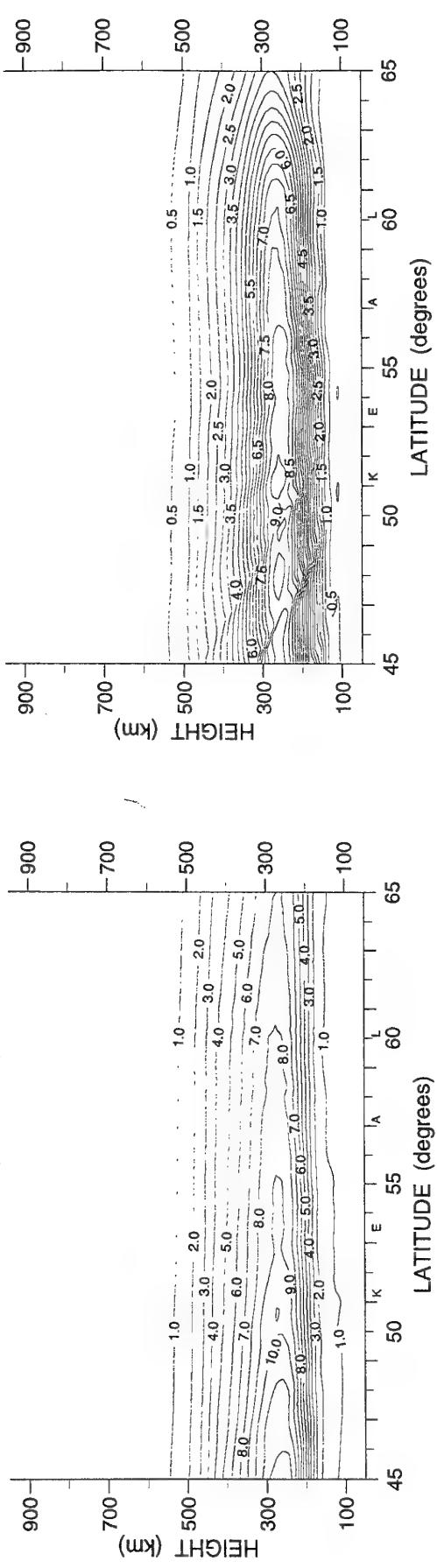
Tomographic Image: 19/02/93 23:46 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

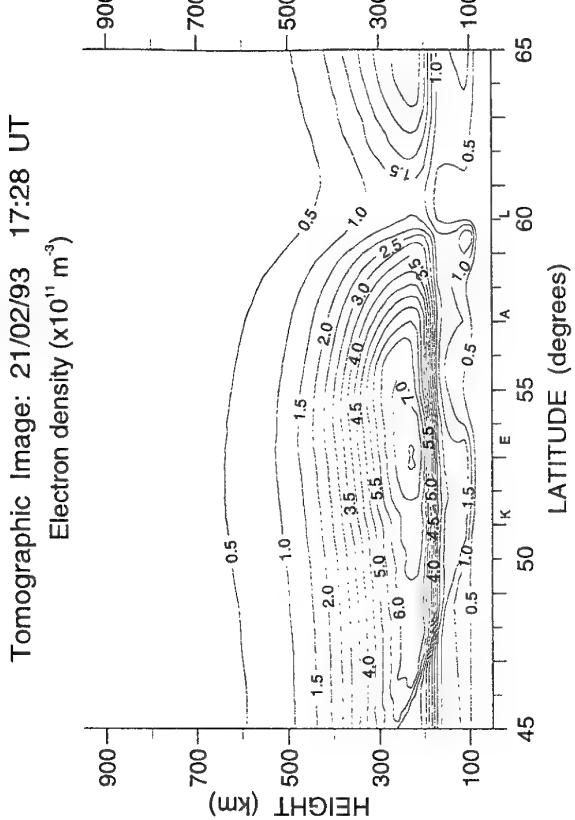
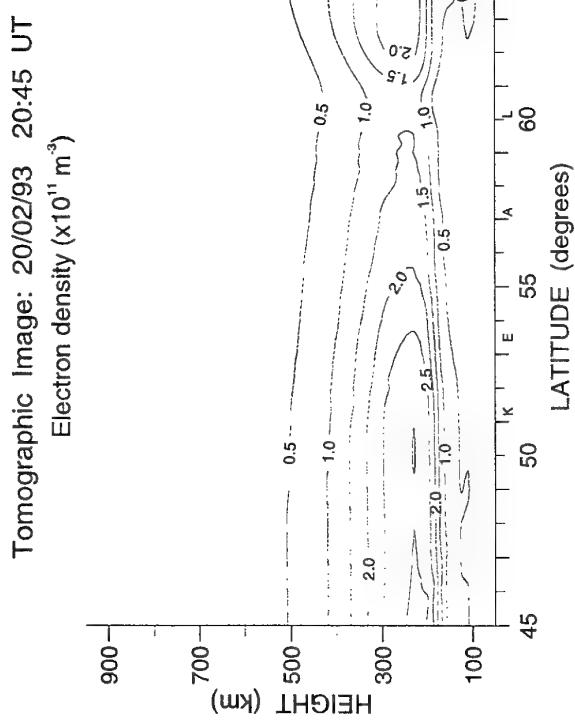
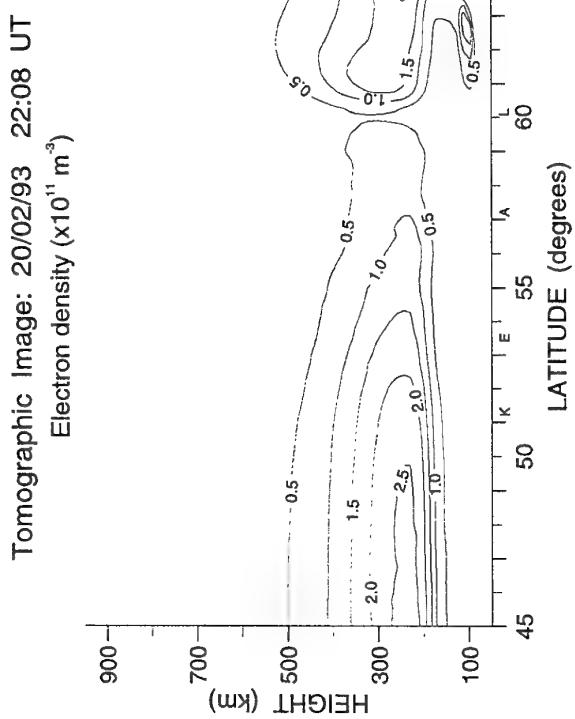
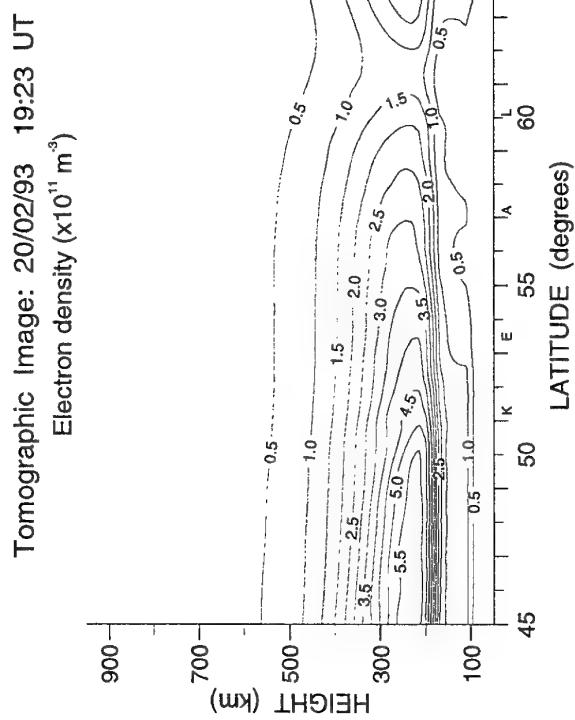


Tomographic Image: 20/02/93 08:23 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

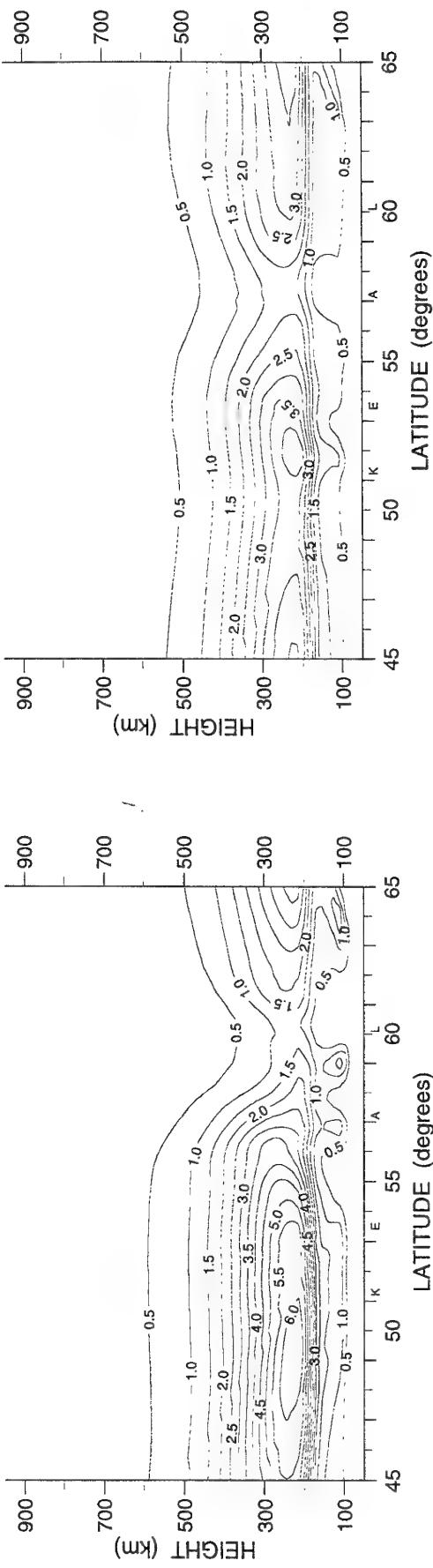


Tomographic Image: 20/02/93 09:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

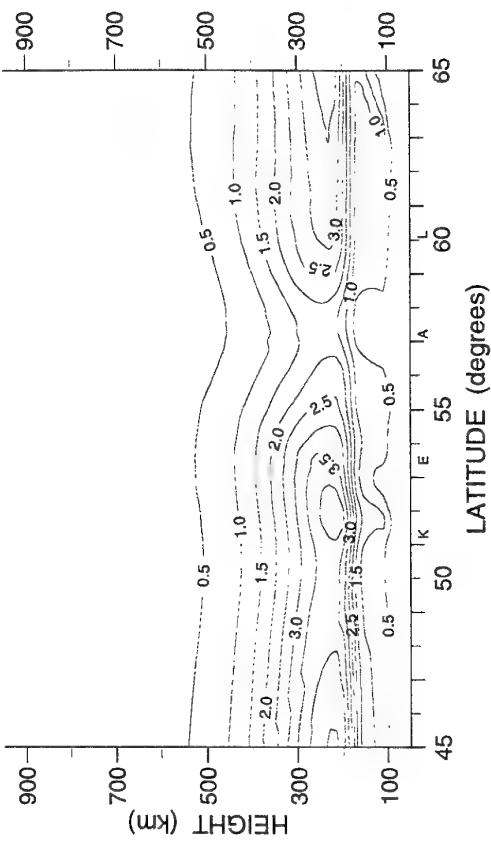




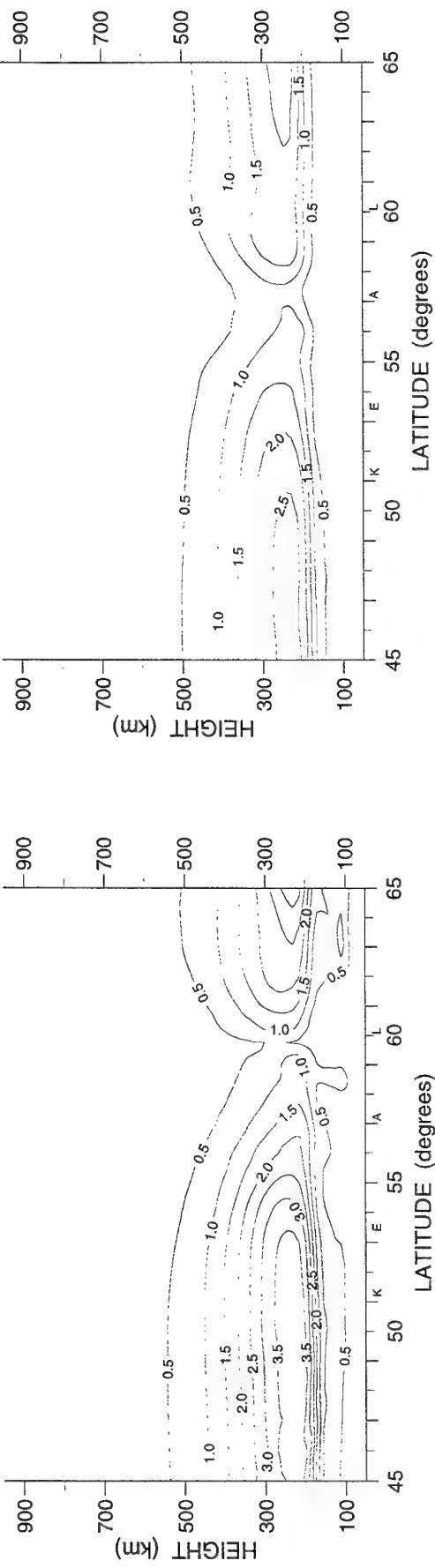
Tomographic Image: 21/02/93 19:00 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



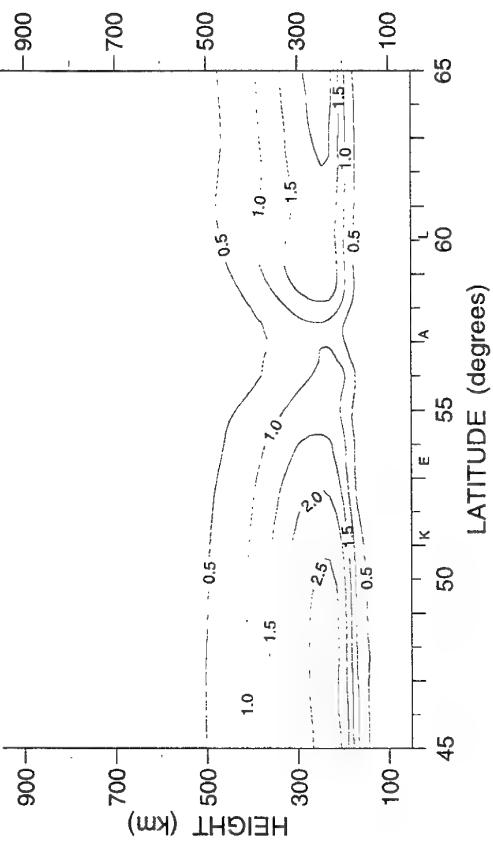
Tomographic Image: 22/02/93 20:26 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



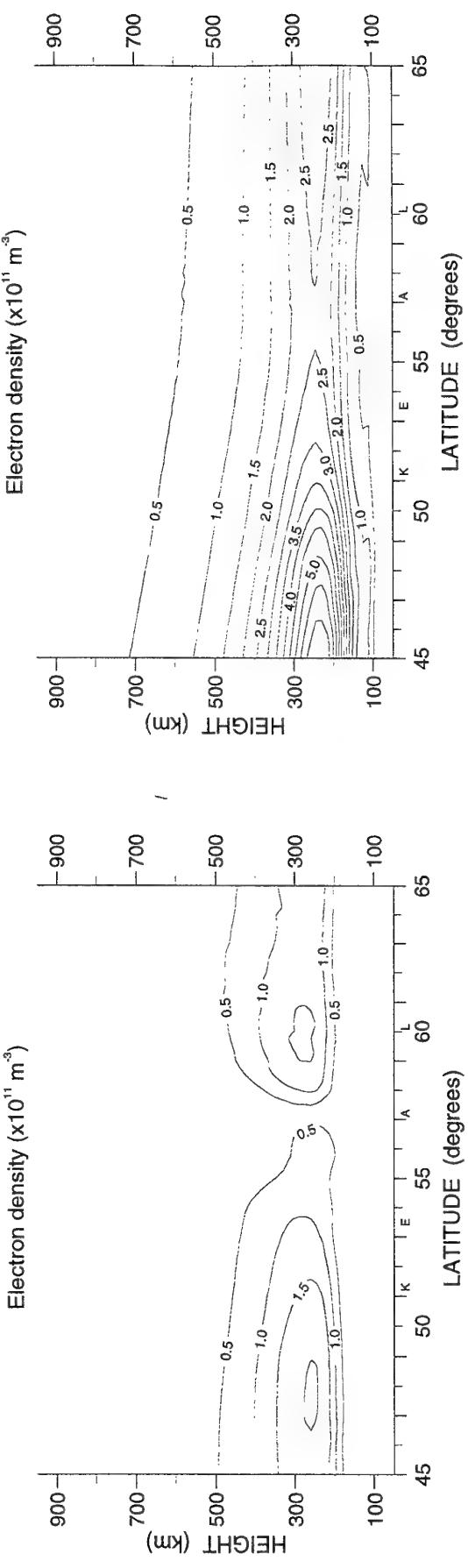
Tomographic Image: 21/02/93 20:22 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



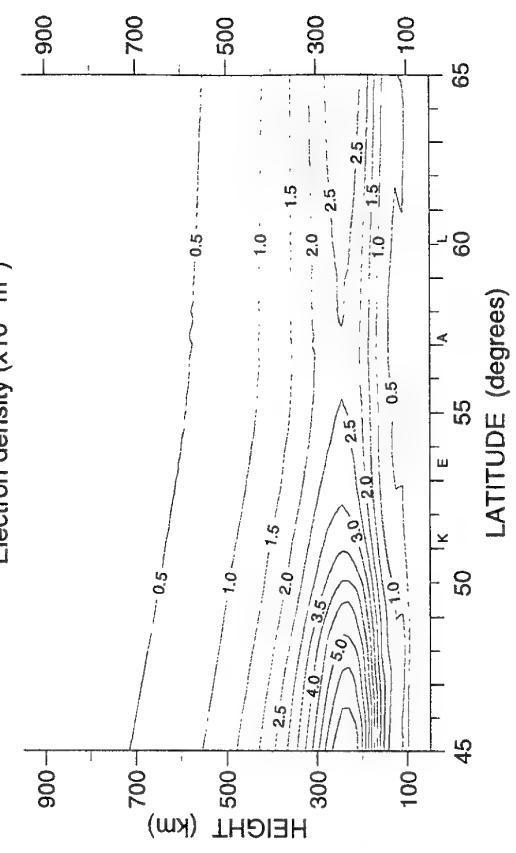
Tomographic Image: 22/02/93 22:29 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



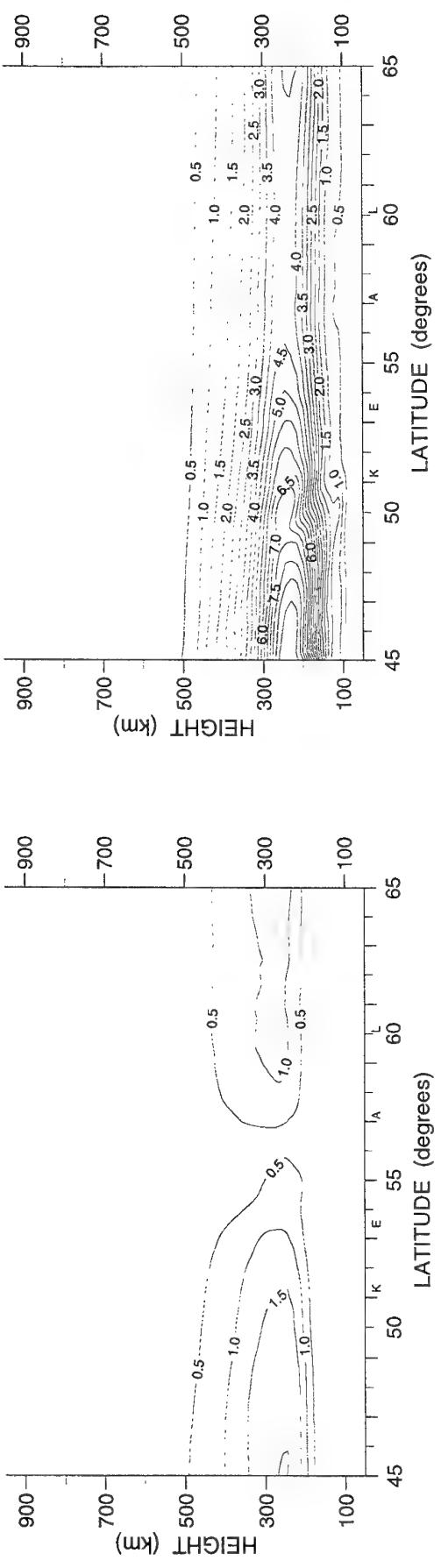
Tomographic Image: 23/02/93 01:05 UT



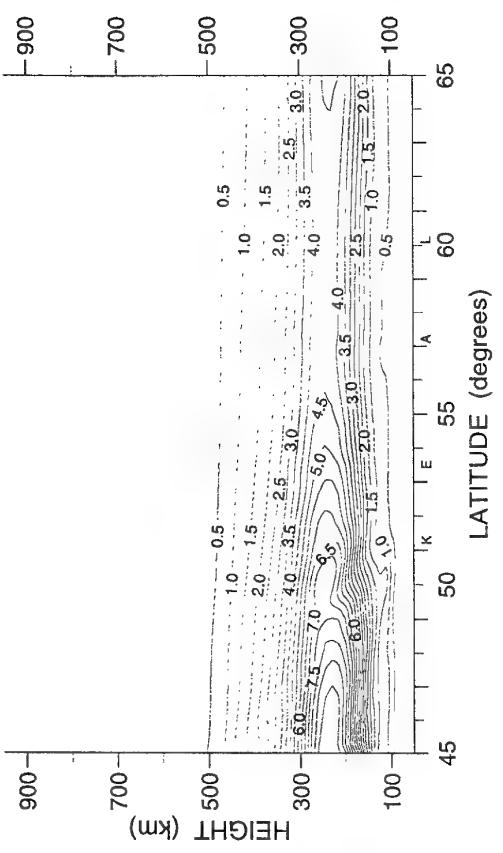
Tomographic Image: 23/02/93 09:03 UT



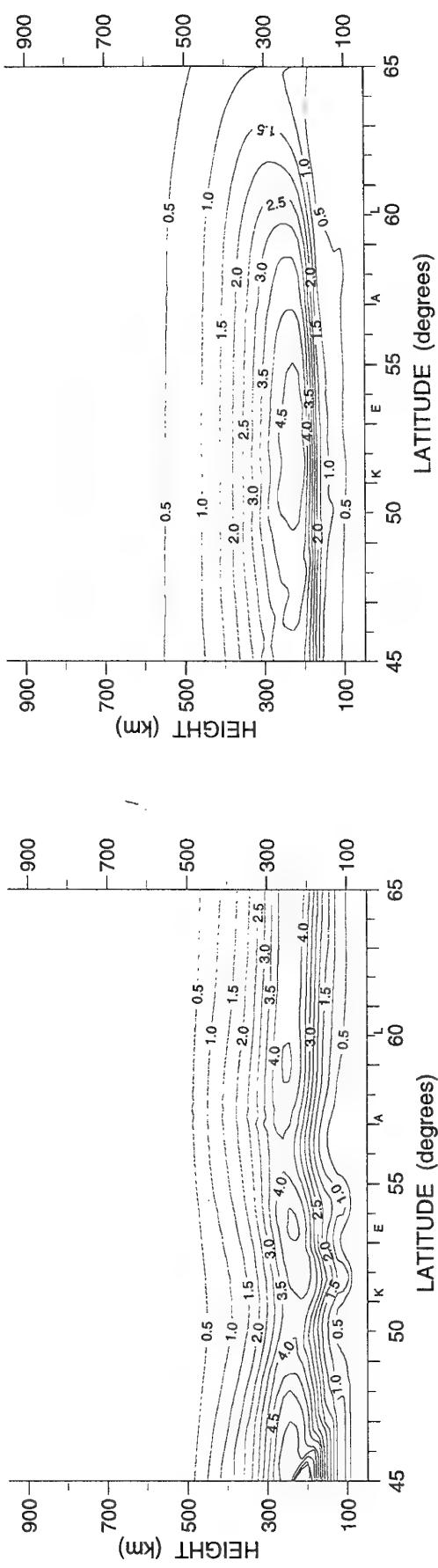
Tomographic Image: 23/02/93 02:54 UT



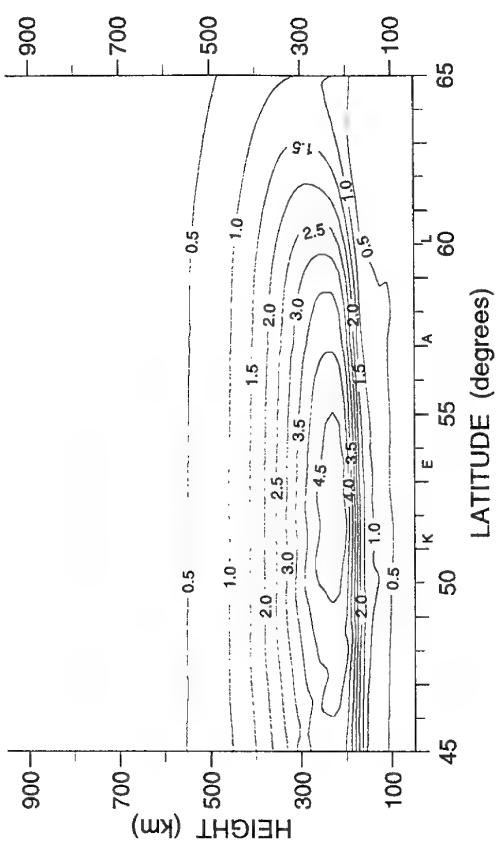
Tomographic Image: 23/02/93 10:18 UT



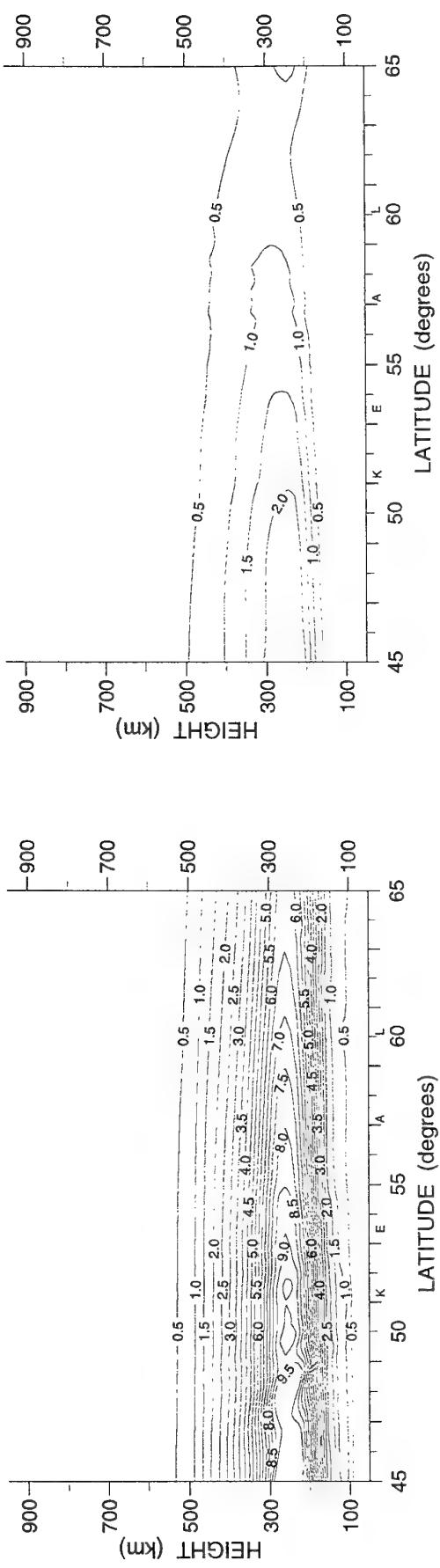
Tomographic Image: 23/02/93 10:52 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



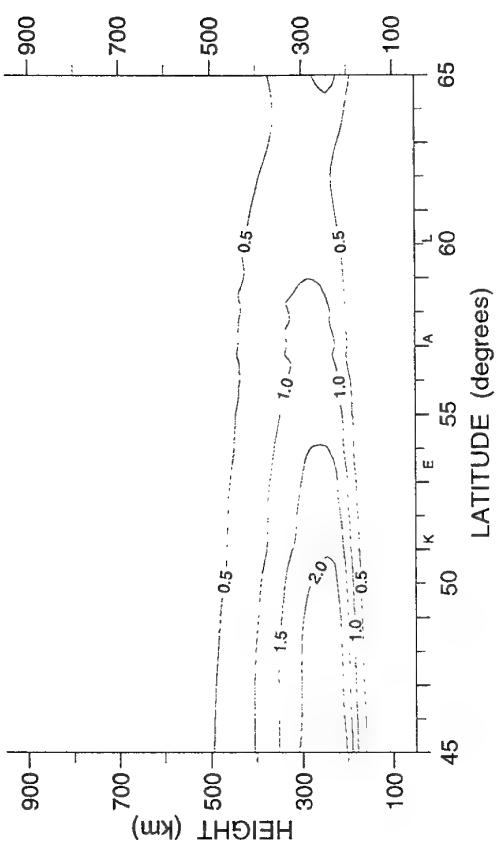
Tomographic Image: 23/02/93 18:14 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

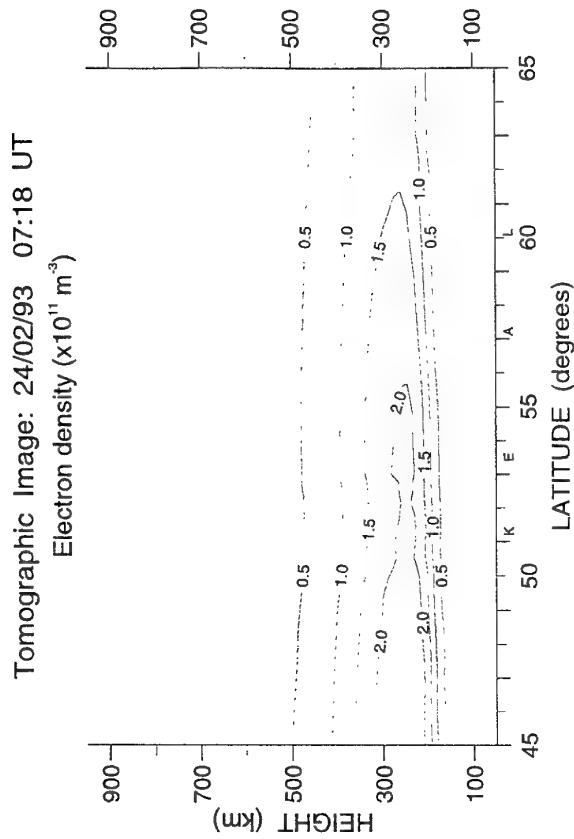
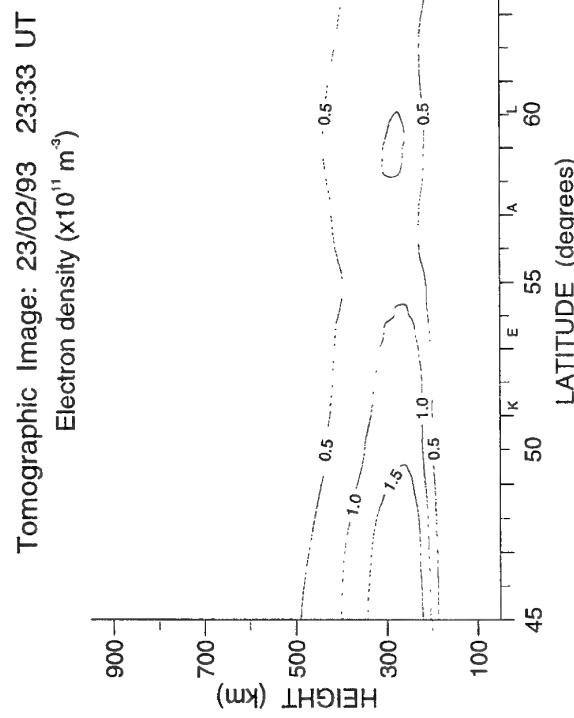
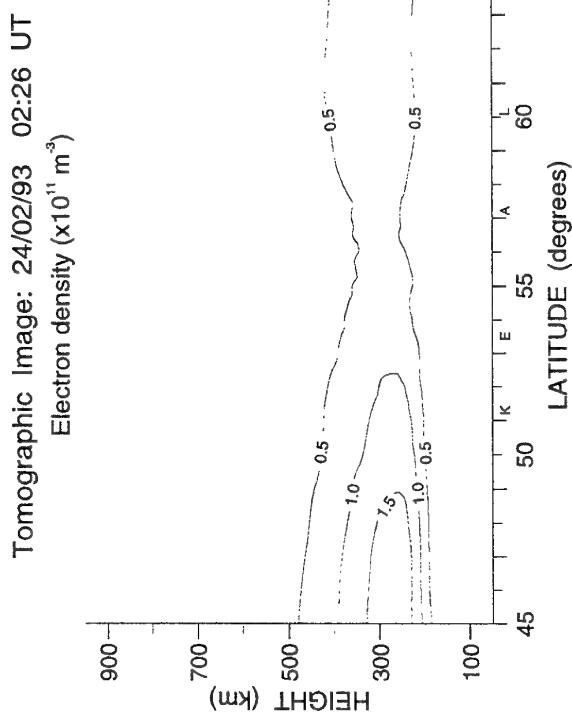
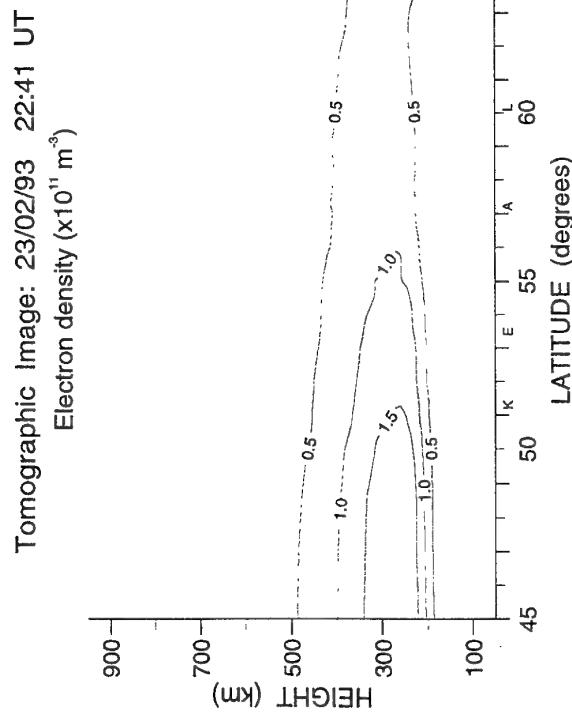


Tomographic Image: 23/02/93 13:24 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

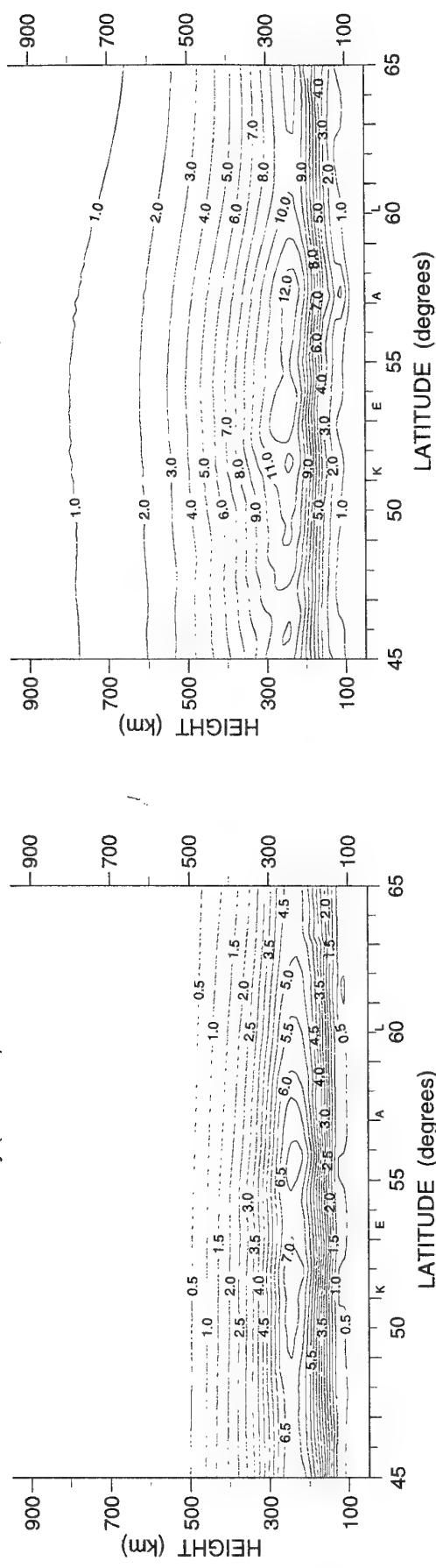


Tomographic Image: 23/02/93 21:25 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

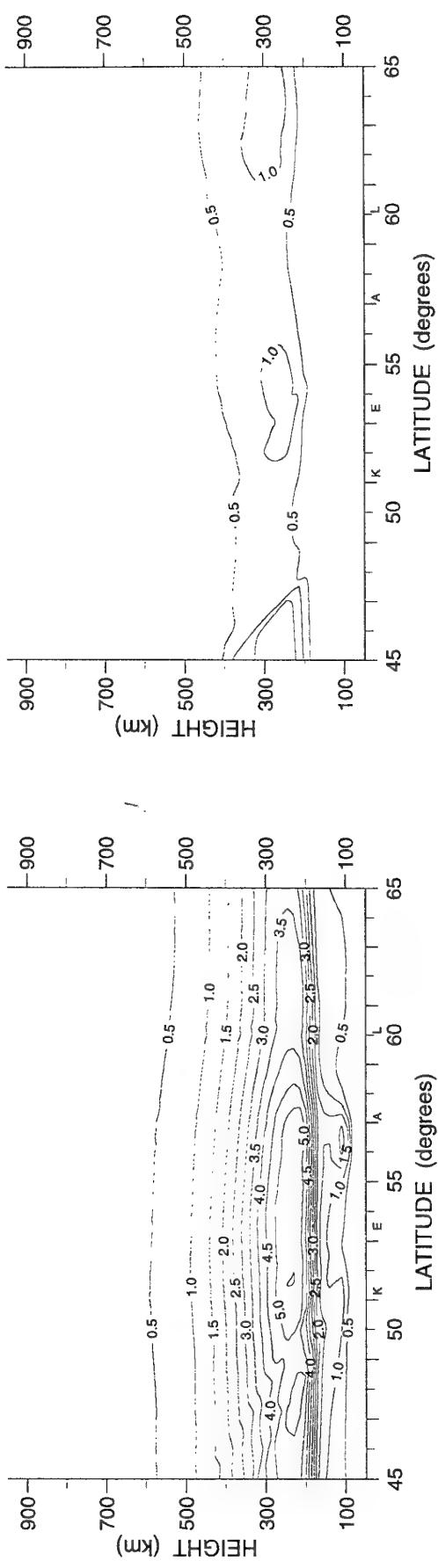




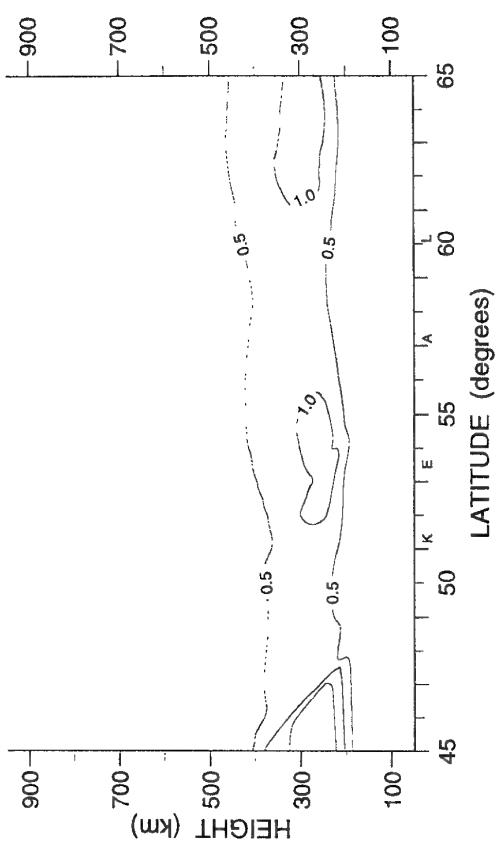
Tomographic Image: 24/02/93 08:40 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



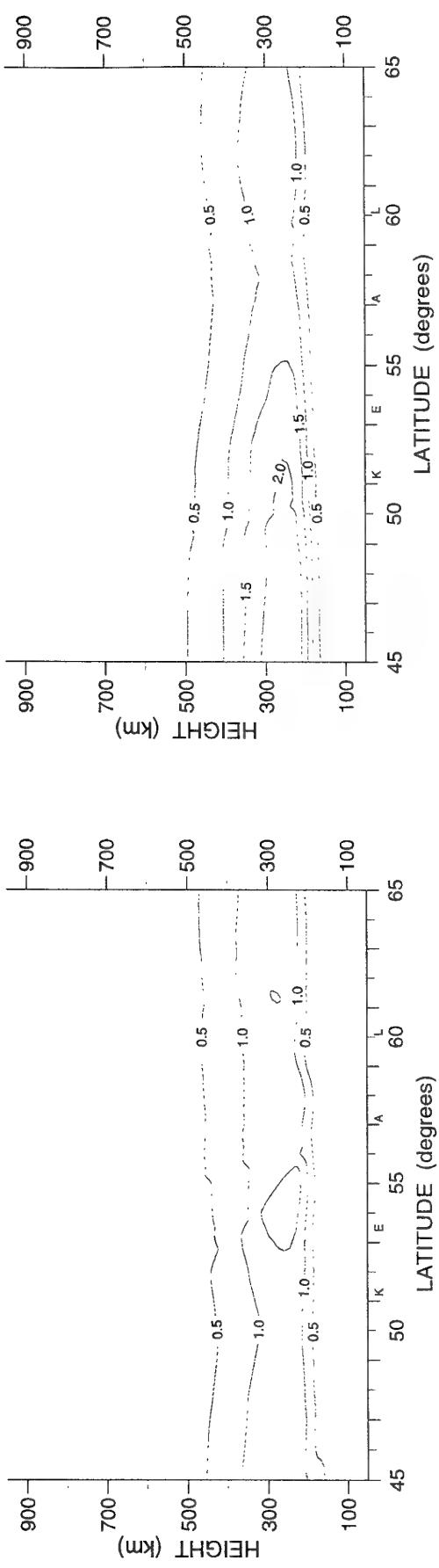
Tomographic Image: 24/02/93 17:51 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



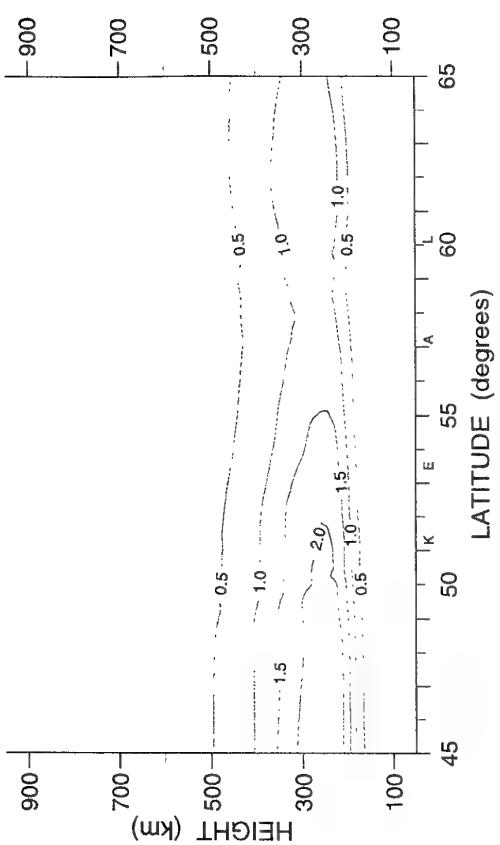
Tomographic Image: 24/02/93 20:10 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



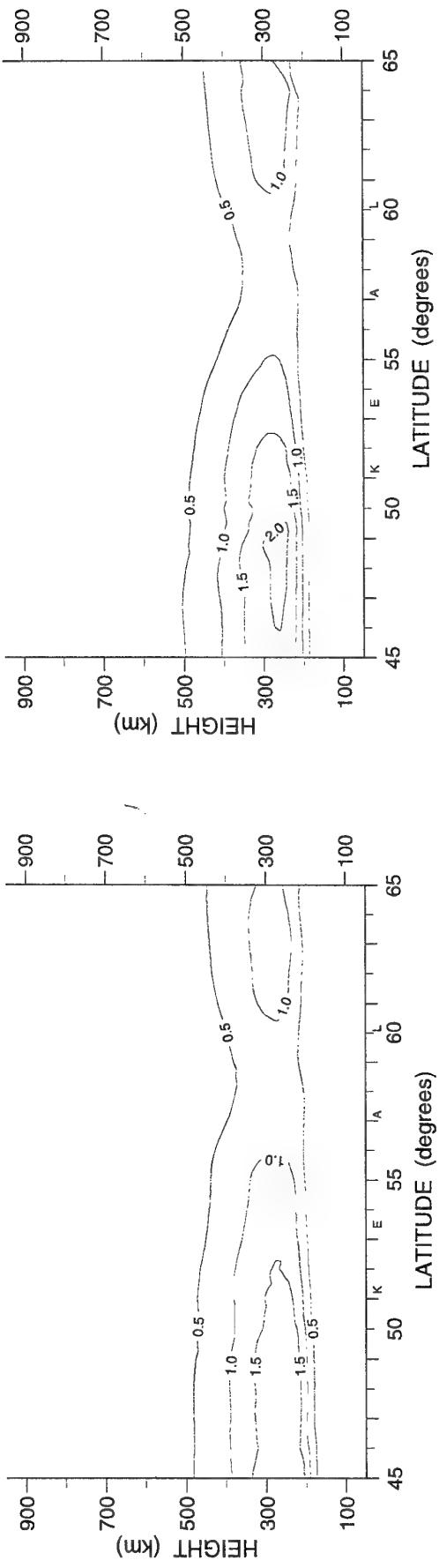
Tomographic Image: 24/02/93 19:13 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



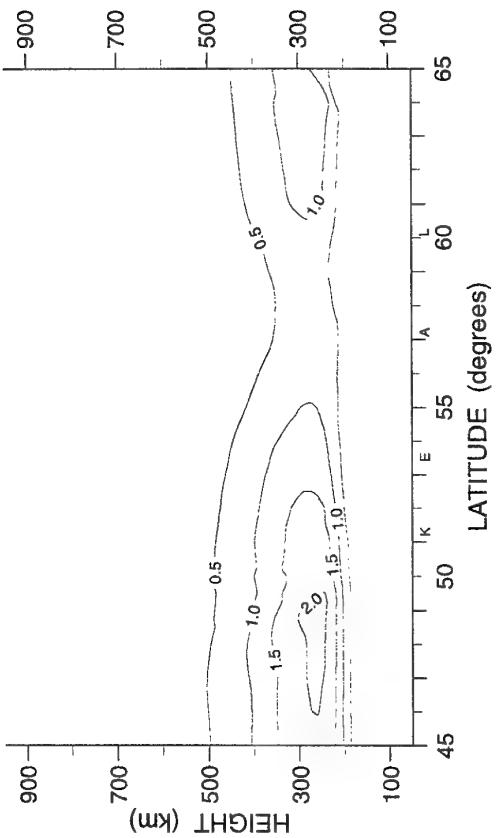
Tomographic Image: 24/02/93 21:02 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



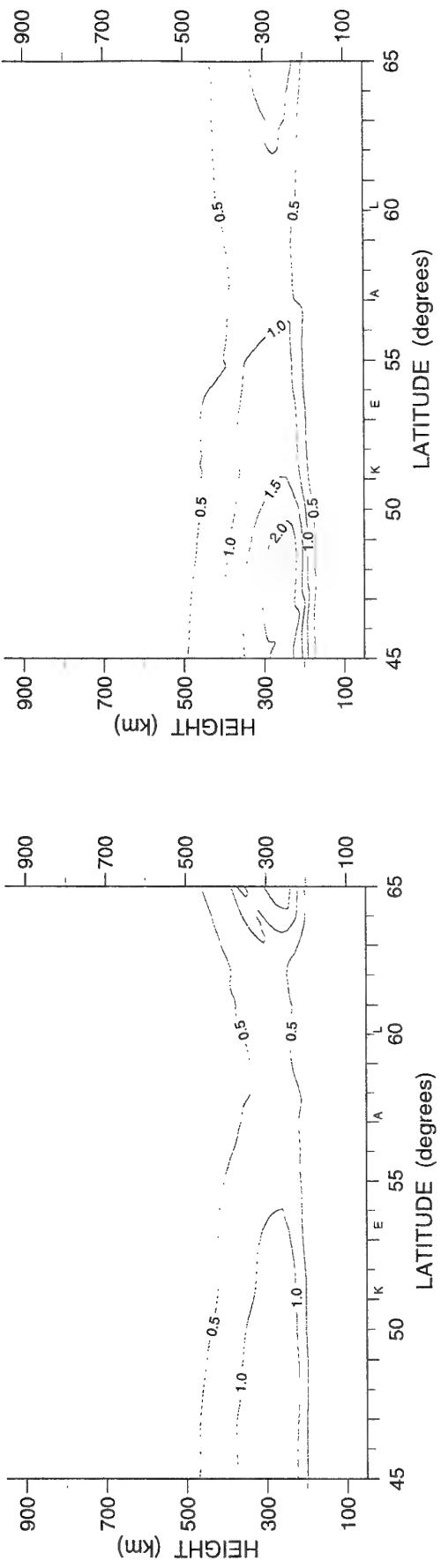
Tomographic Image: 24/02/93 21:58 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



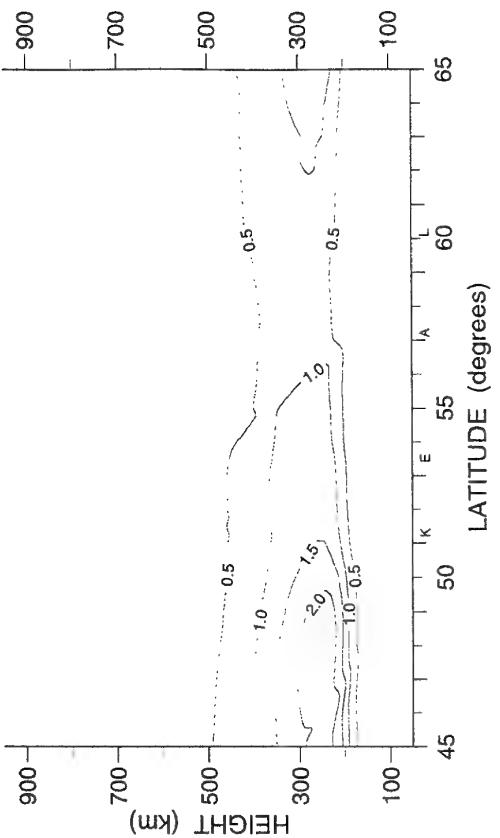
Tomographic Image: 25/02/93 01:58 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



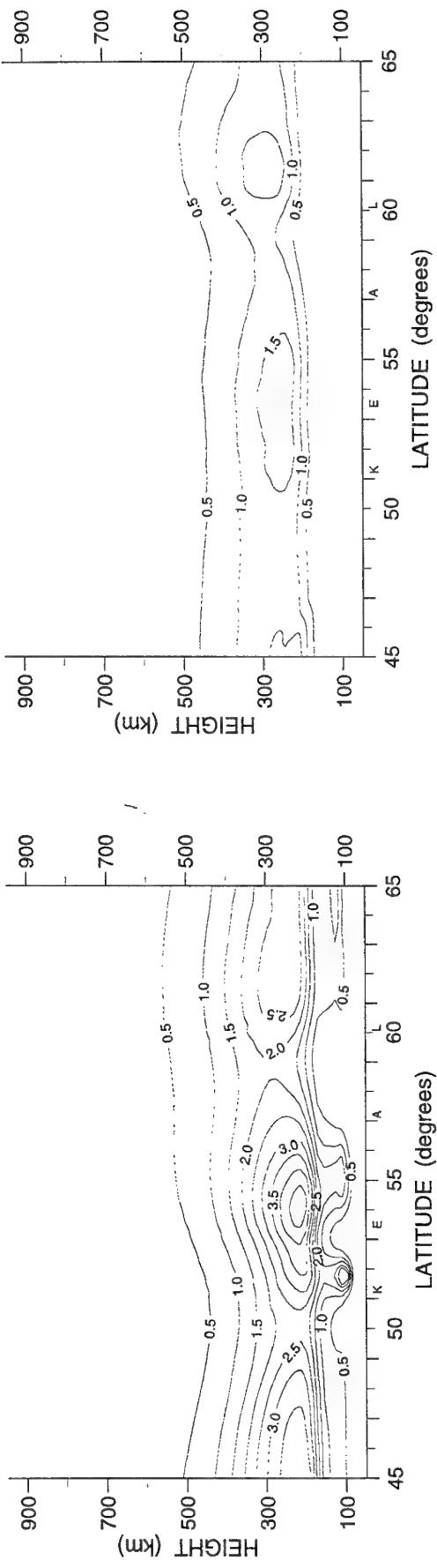
Tomographic Image: 25/02/93 00:09 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



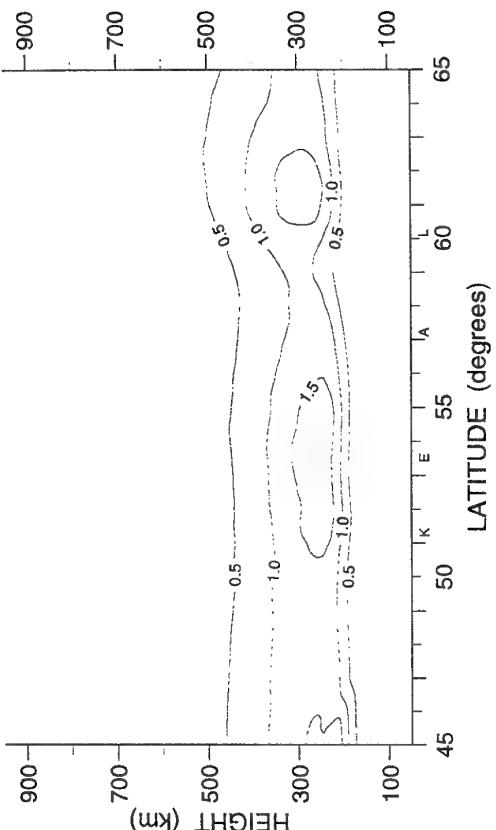
Tomographic Image: 25/02/93 04:05 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



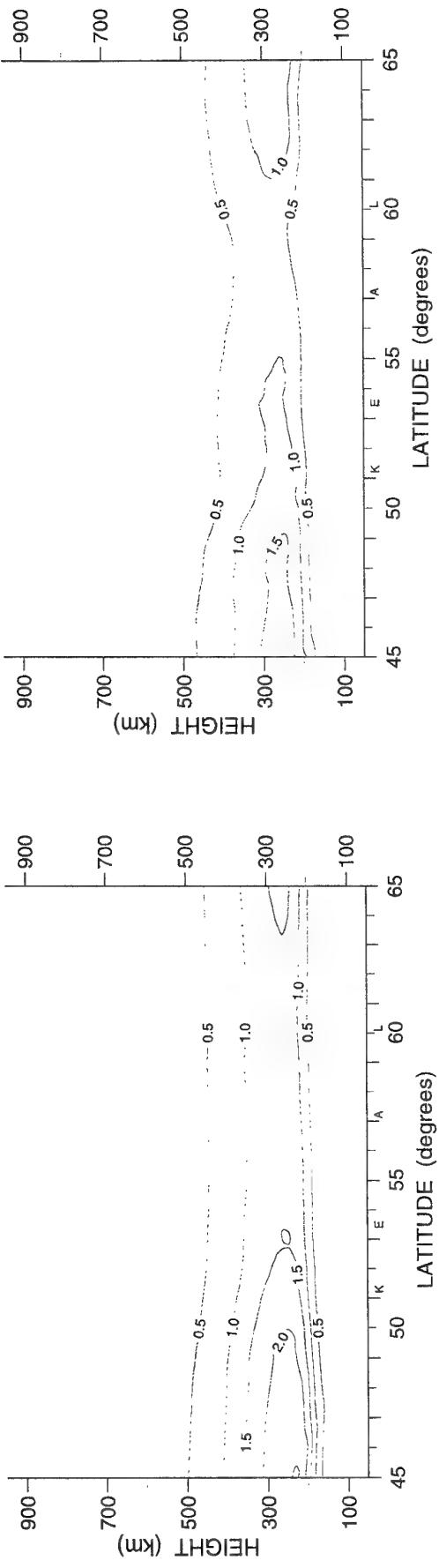
Tomographic Image: 25/02/93 06:28 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



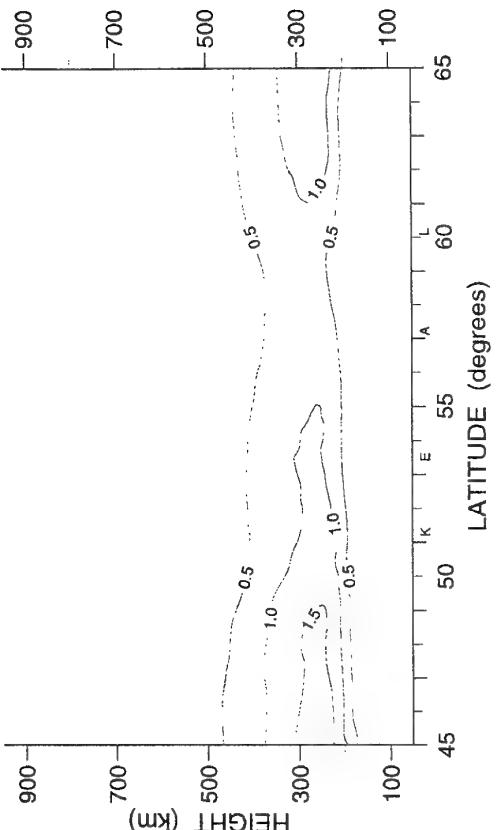
Tomographic Image: 25/02/93 20:19 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



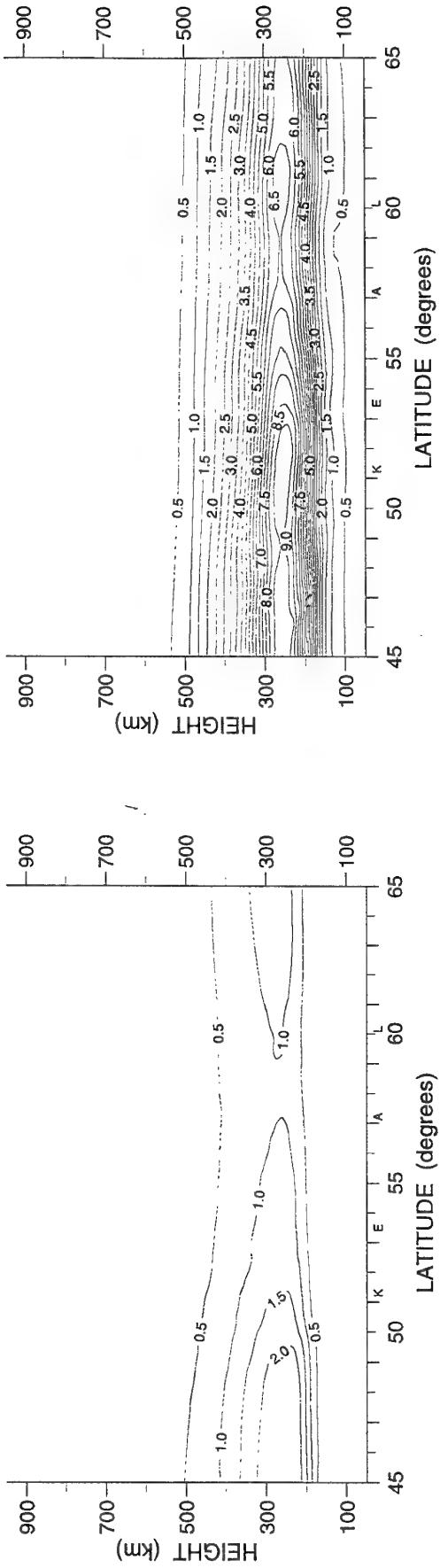
Tomographic Image: 25/02/93 06:55 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



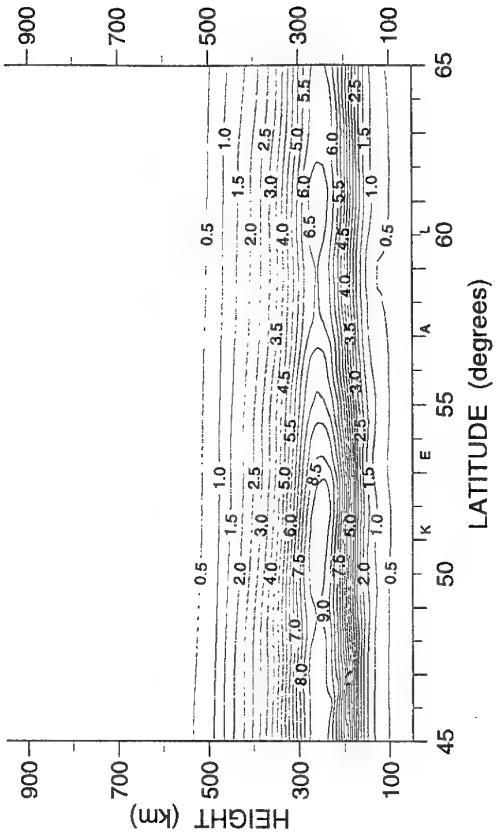
Tomographic Image: 26/02/93 04:43 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



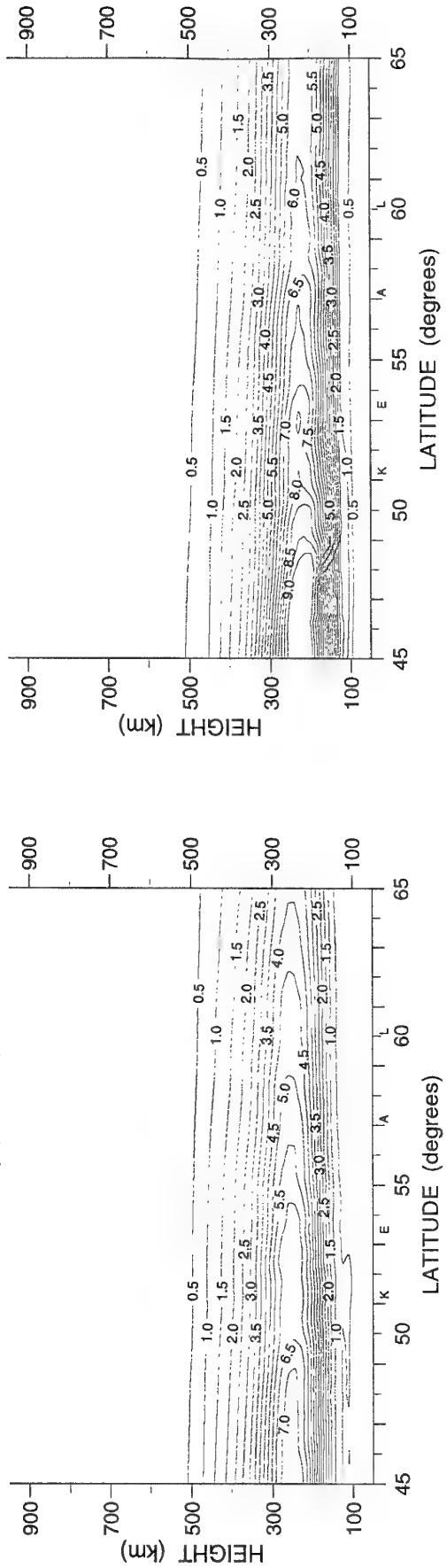
Tomographic Image: 26/02/93 06:32 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



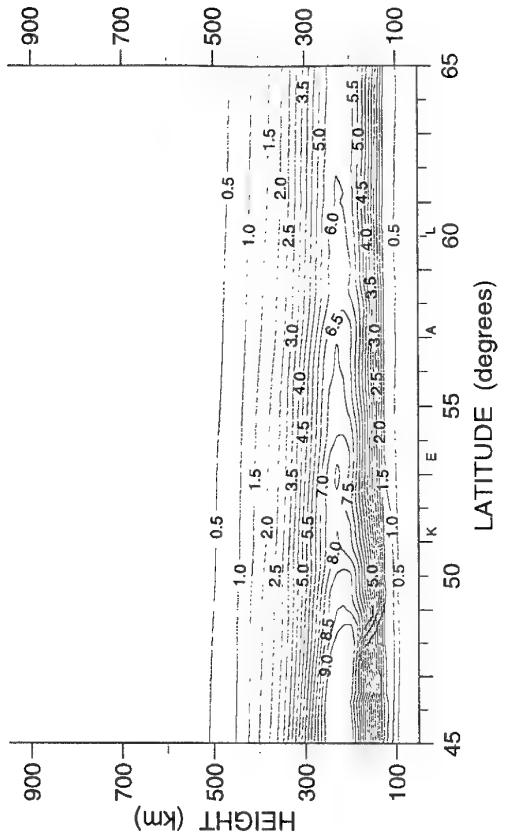
Tomographic Image: 26/02/93 09:12 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

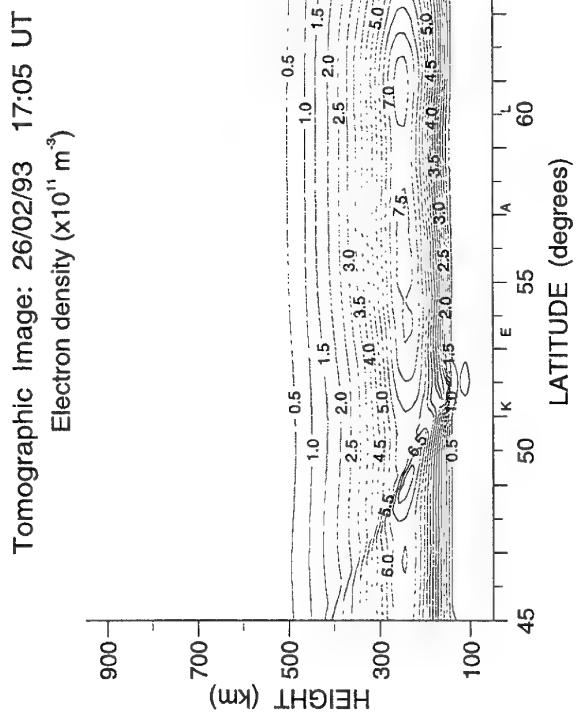


Tomographic Image: 26/02/93 07:54 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

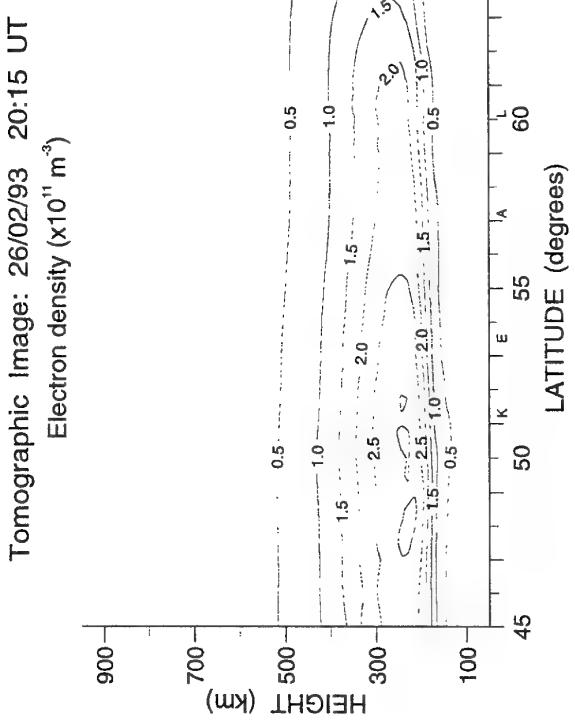


Tomographic Image: 26/02/93 10:08 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

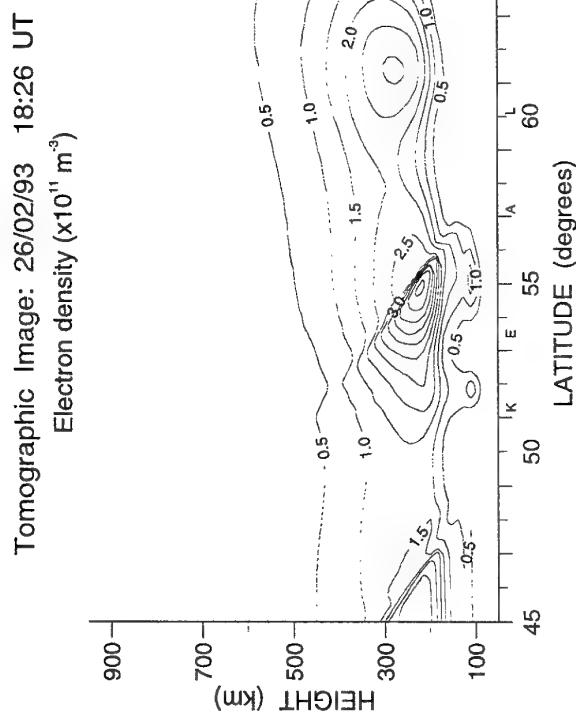




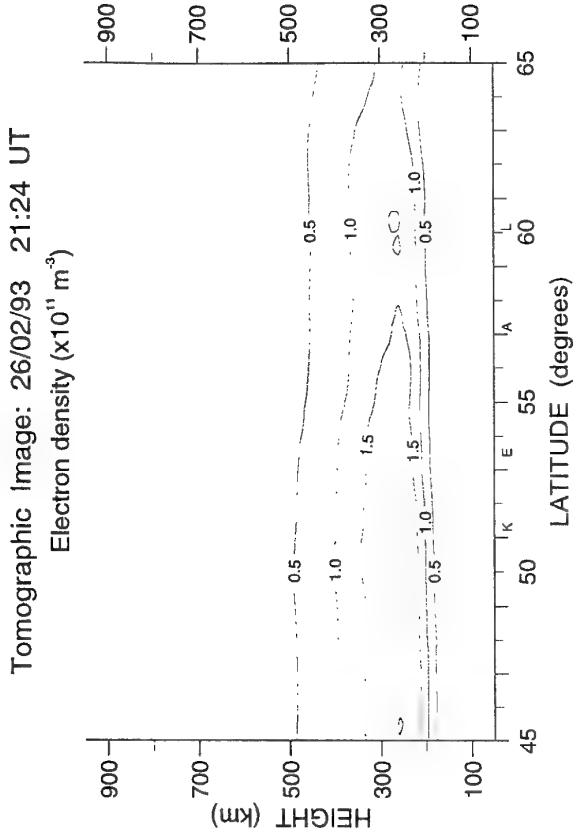
Tomographic Image: 26/02/93 17:05 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



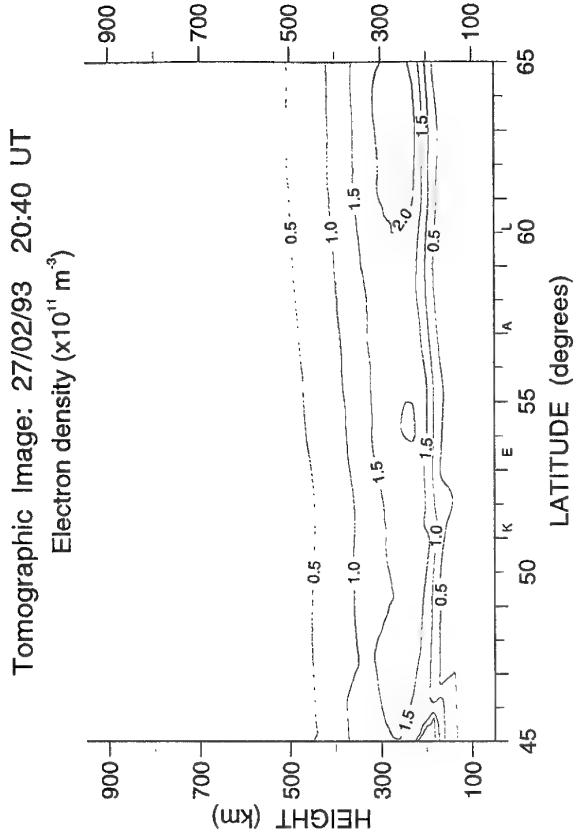
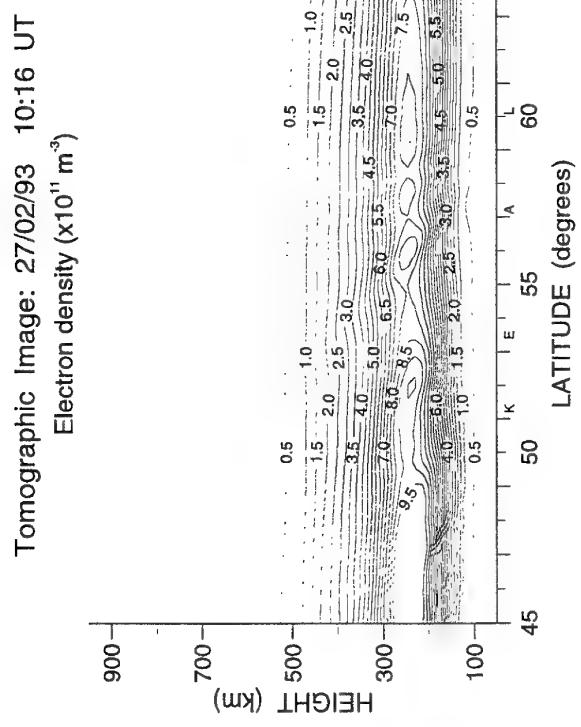
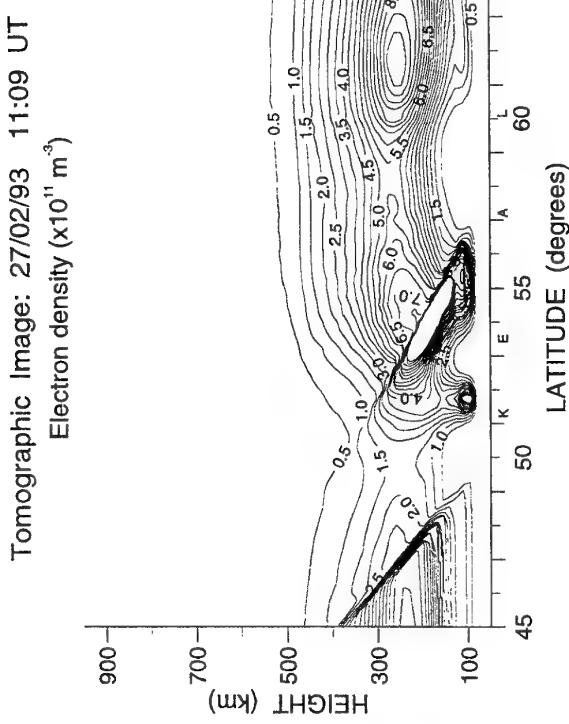
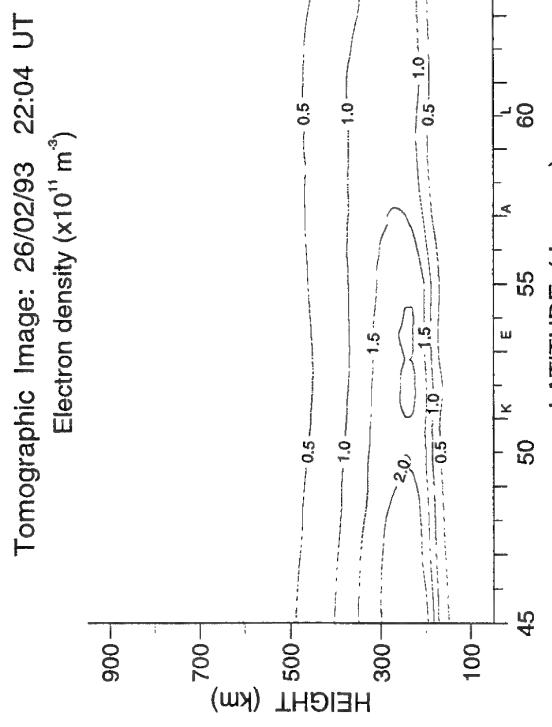
Tomographic Image: 26/02/93 20:15 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



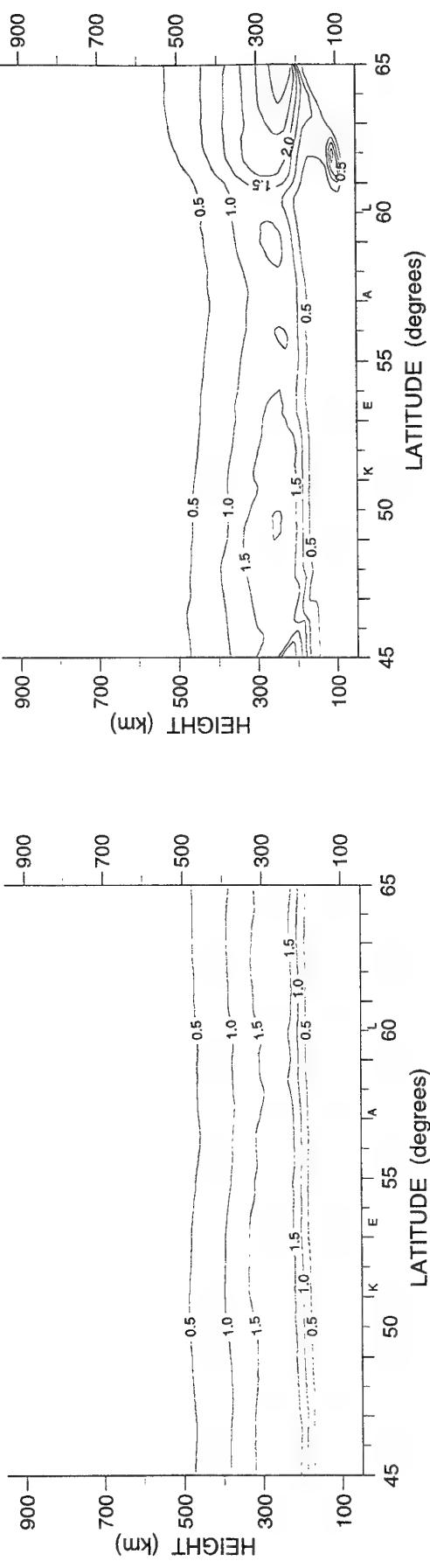
Tomographic Image: 26/02/93 18:26 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



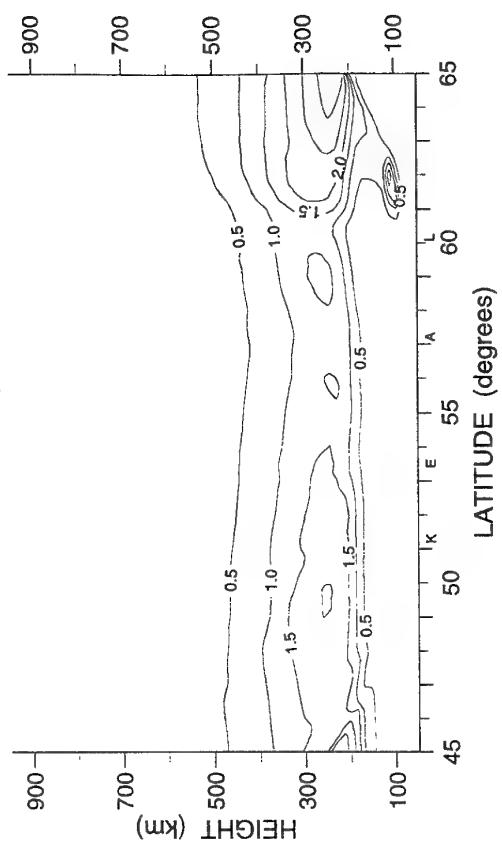
Tomographic Image: 26/02/93 21:24 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



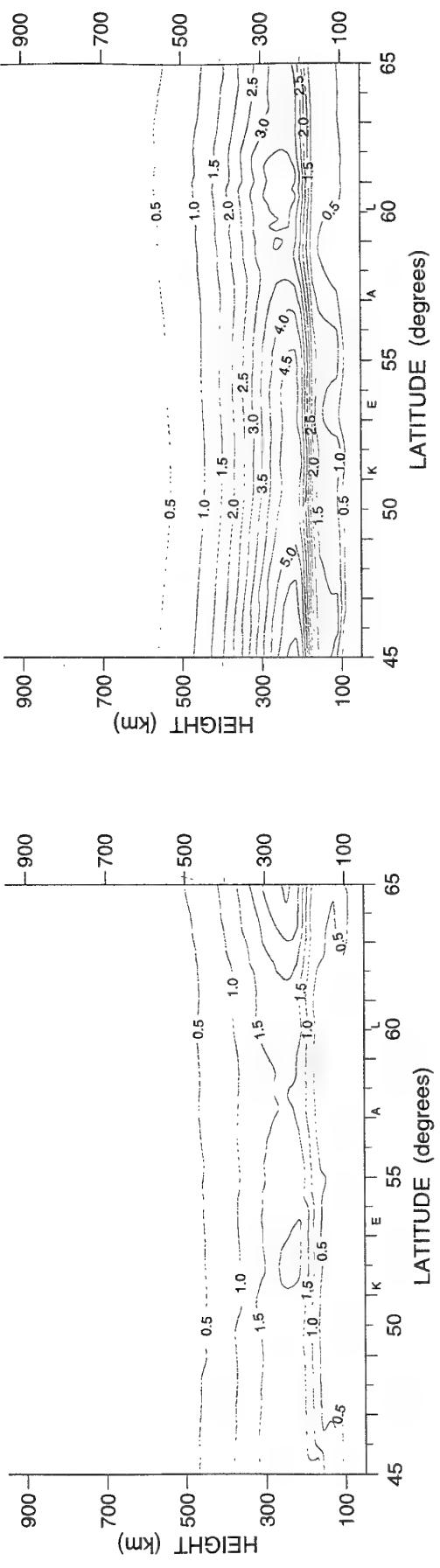
Tomographic Image: 27/02/93 22:28 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



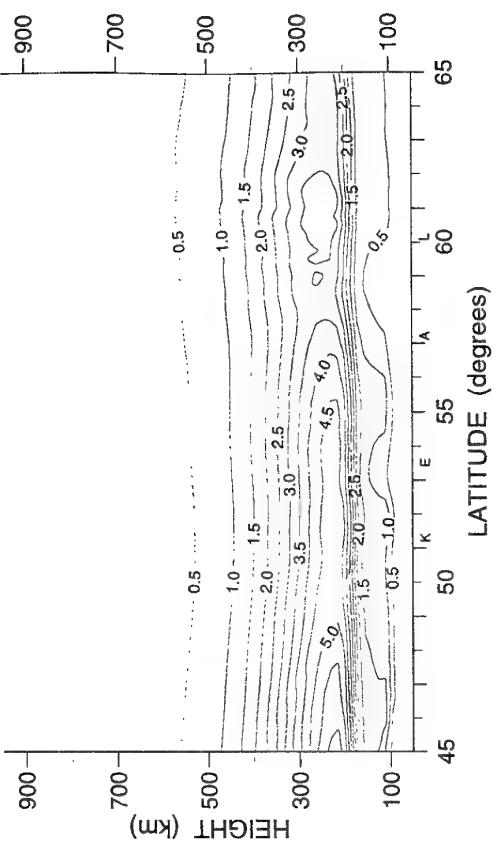
Tomographic Image: 28/02/93 00:35 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

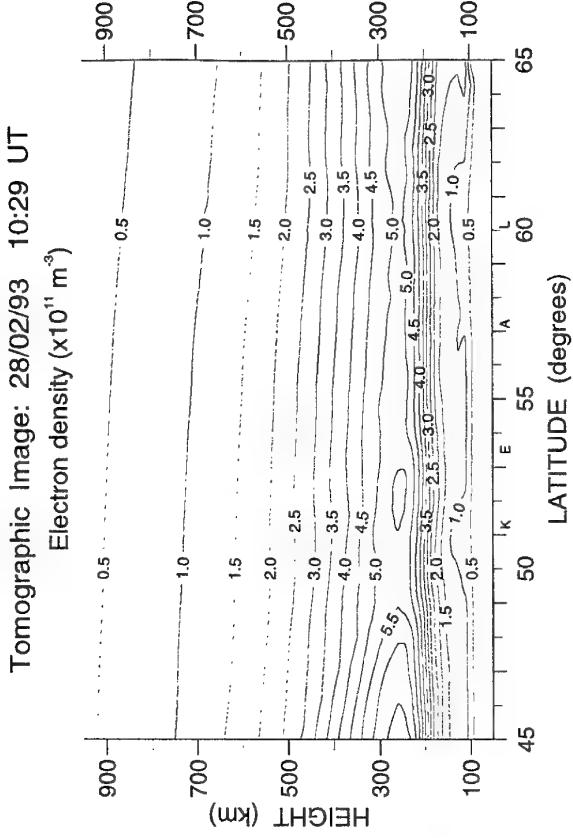
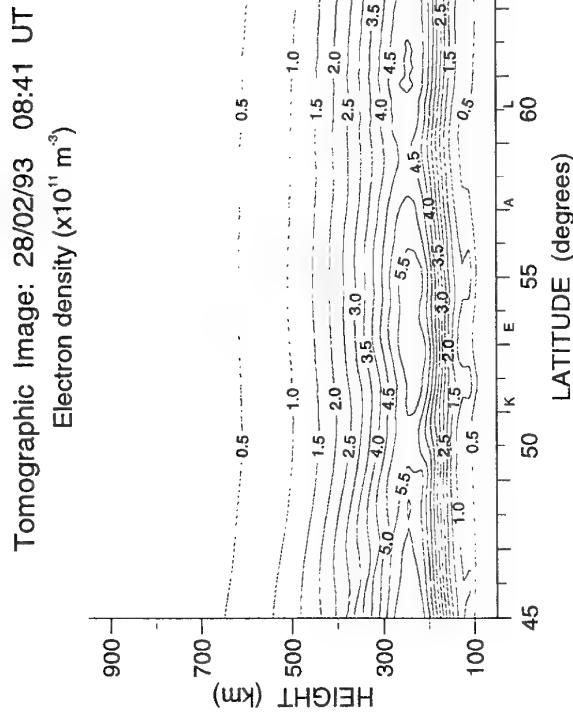
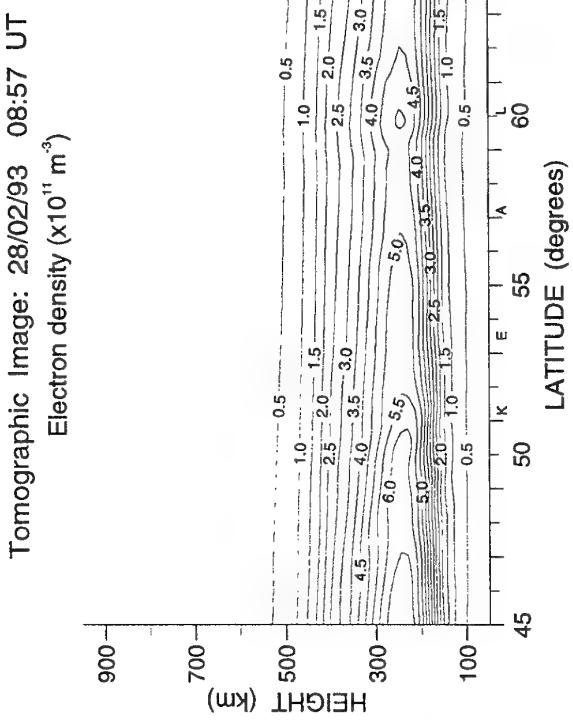
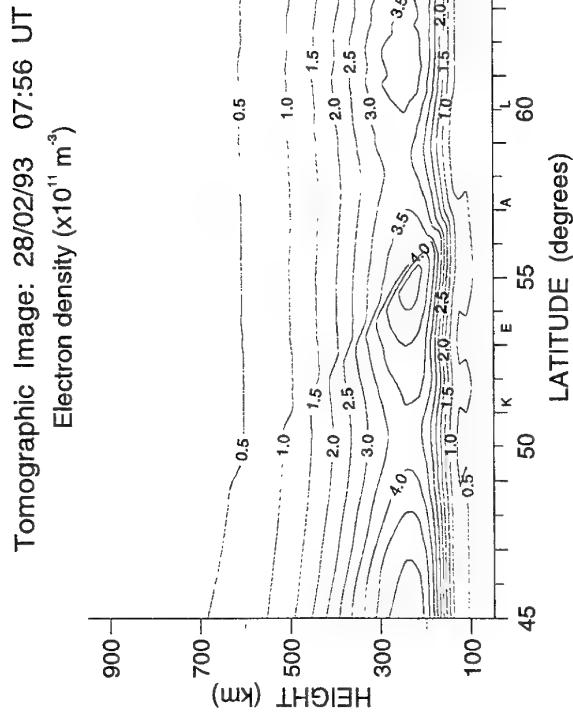


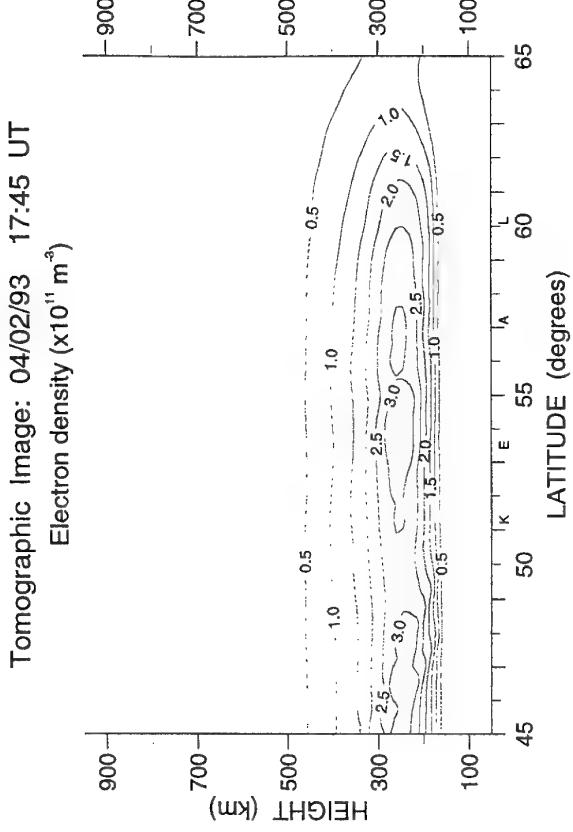
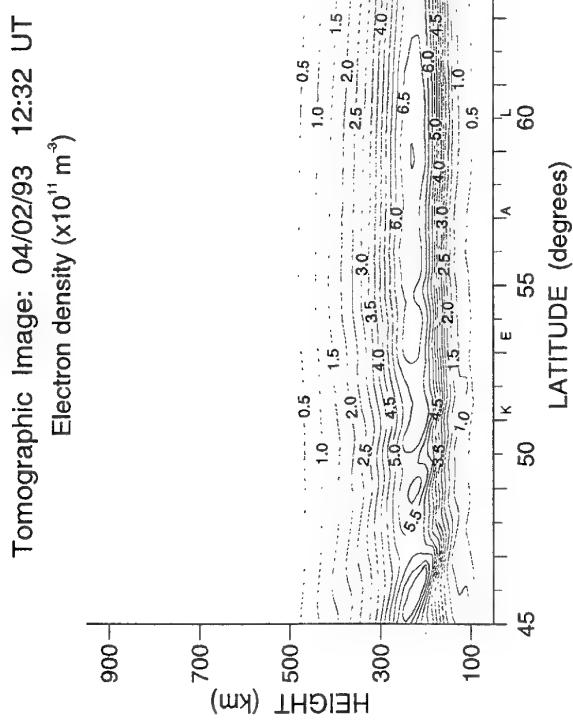
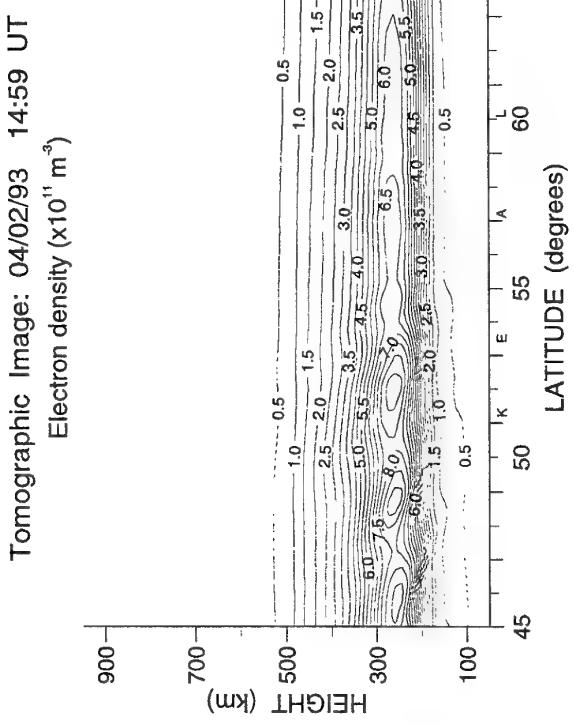
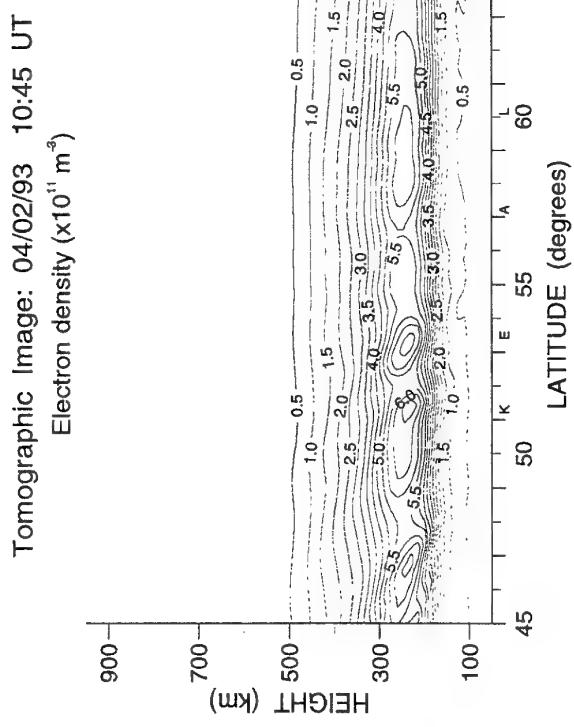
Tomographic Image: 27/02/93 23:23 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

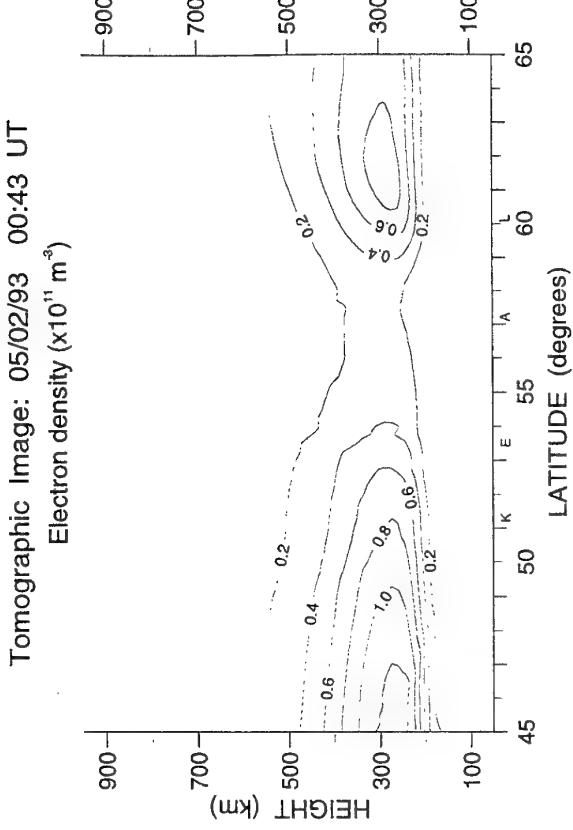
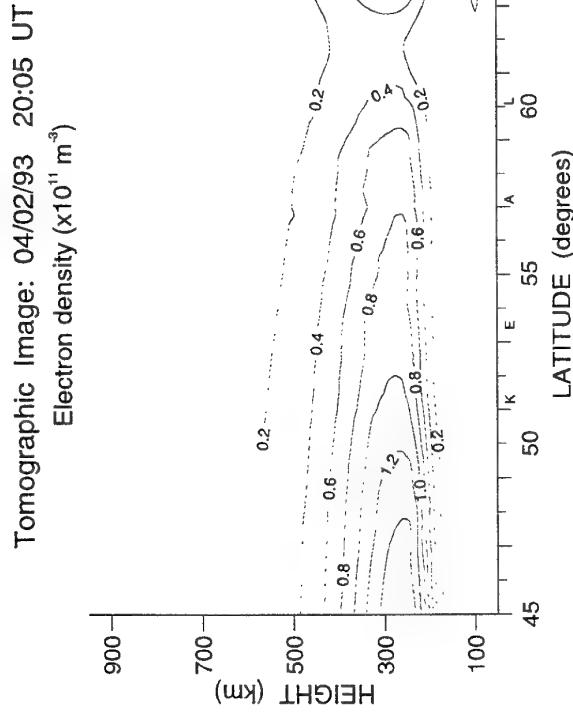
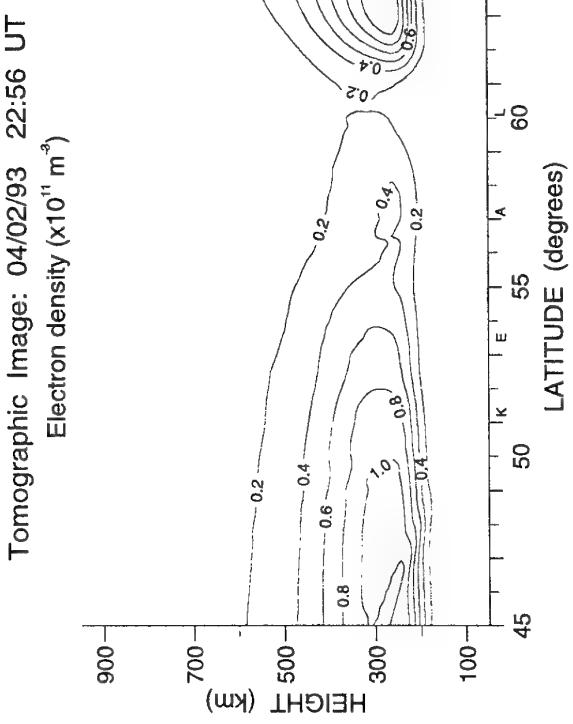
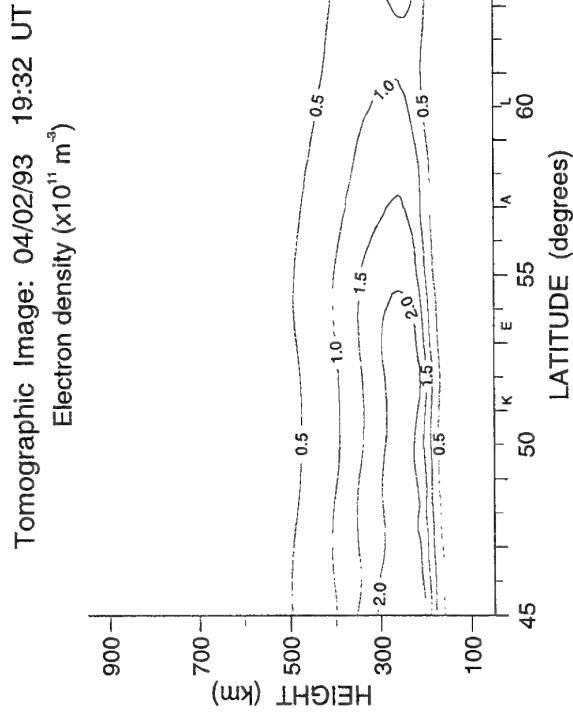


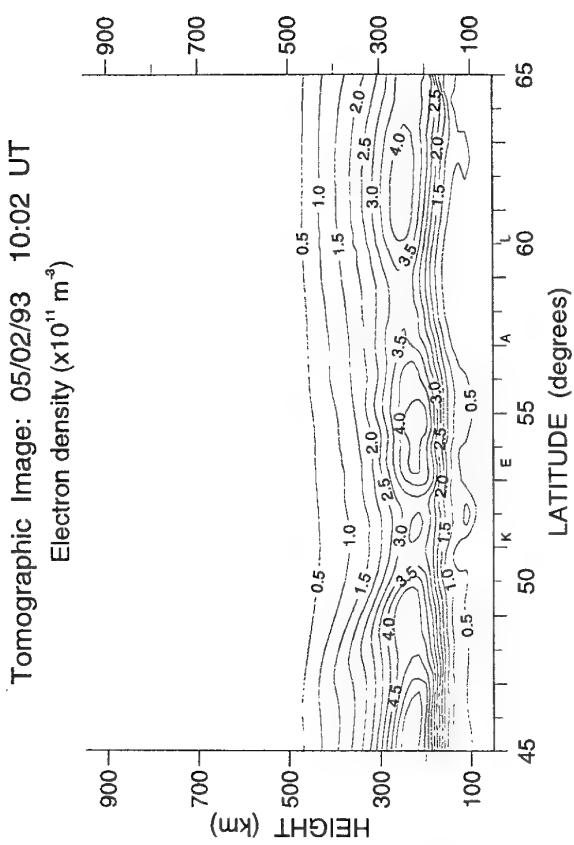
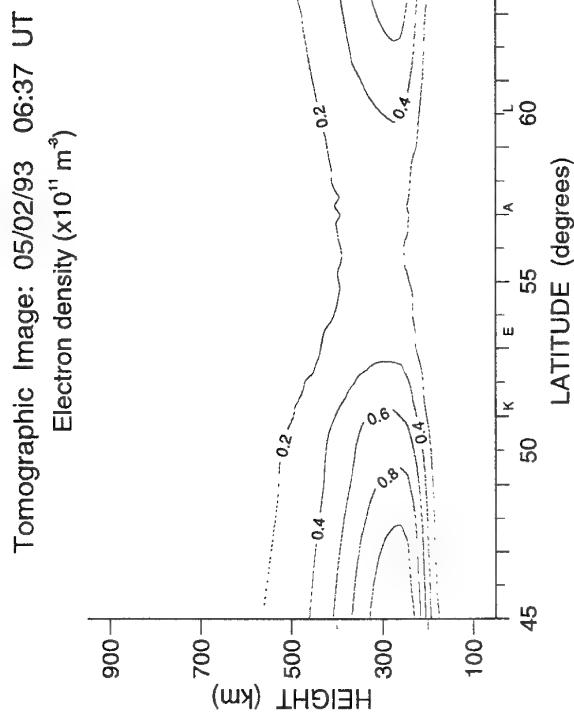
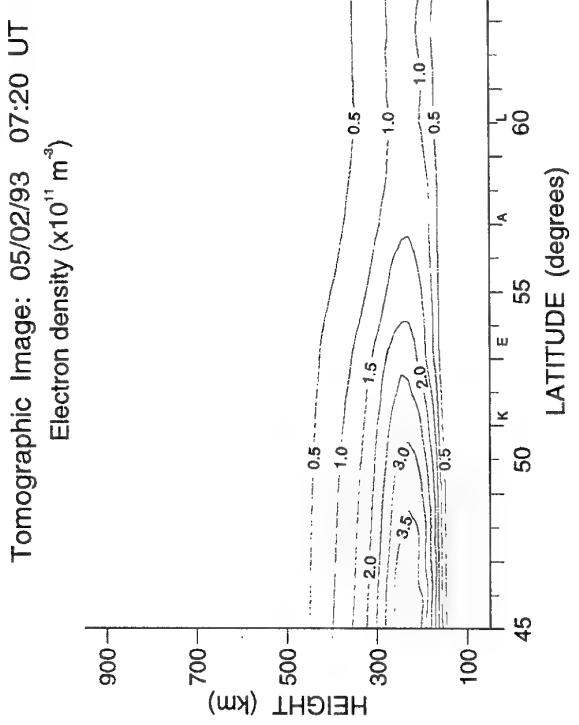
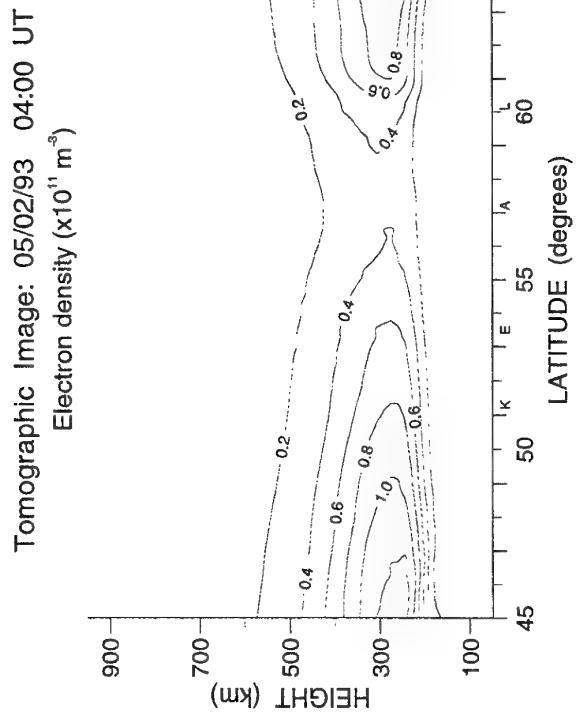
Tomographic Image: 28/02/93 07:08 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



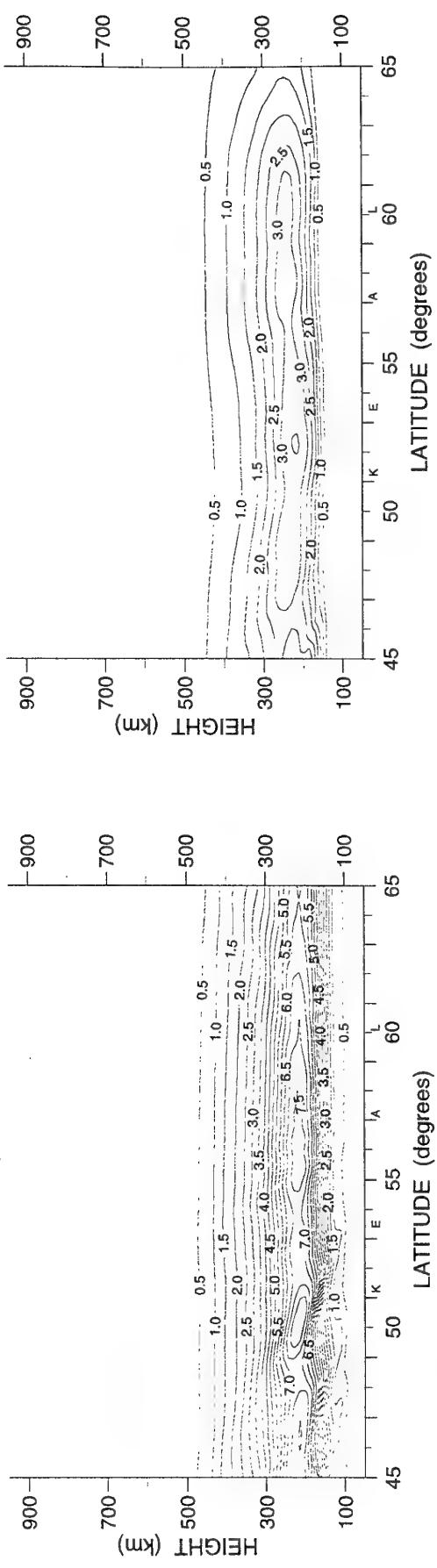






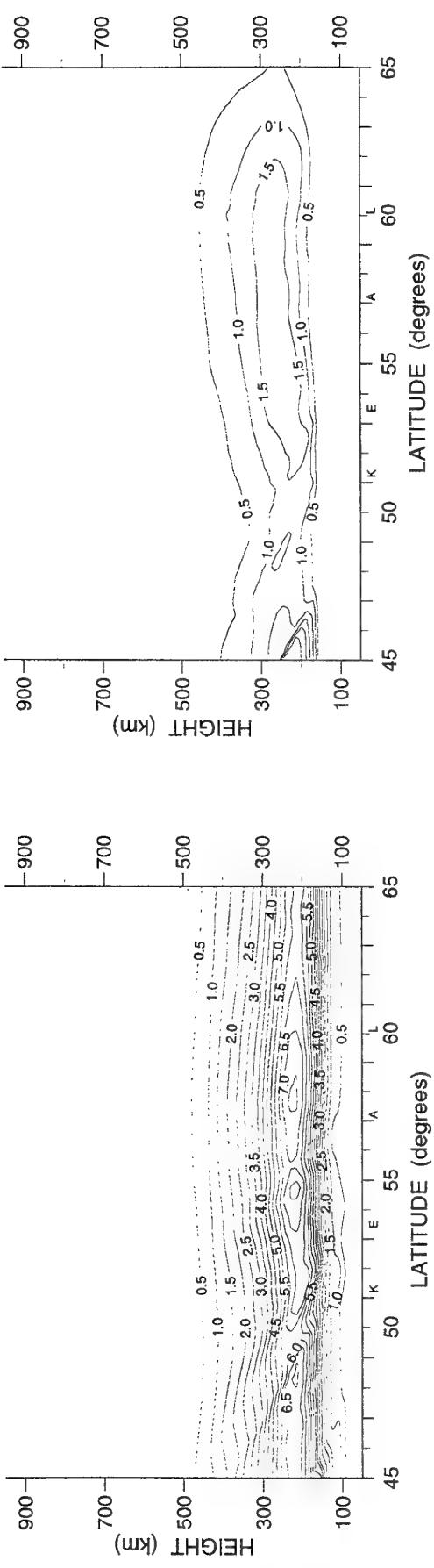


Tomographic Image: 05/02/93 11:49 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



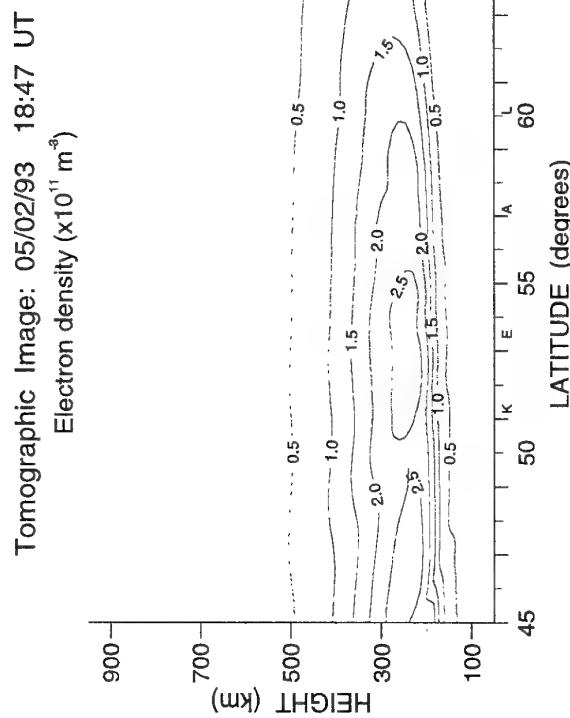
Tomographic Image: 05/02/93 16:59 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

Tomographic Image: 05/02/93 12:09 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

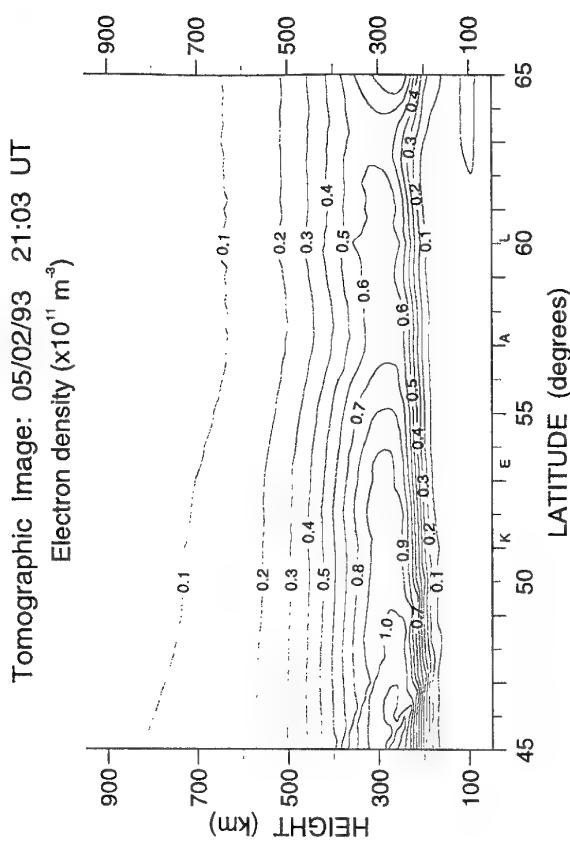


Tomographic Image: 05/02/93 17:53 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

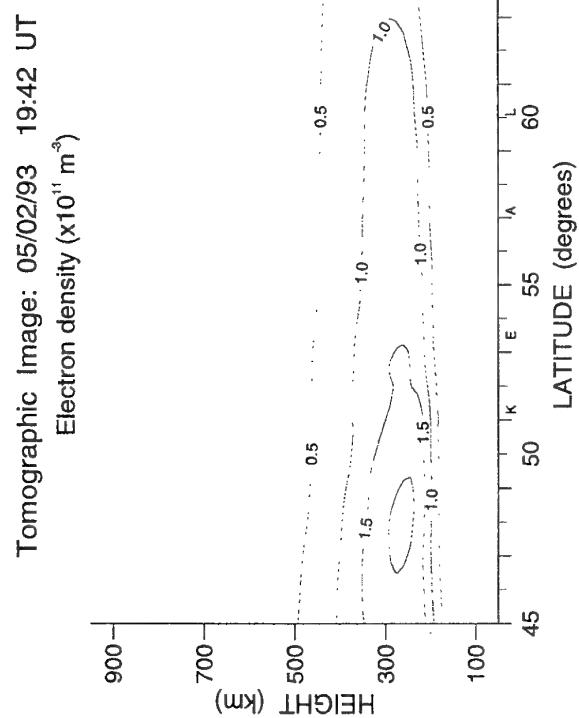
56



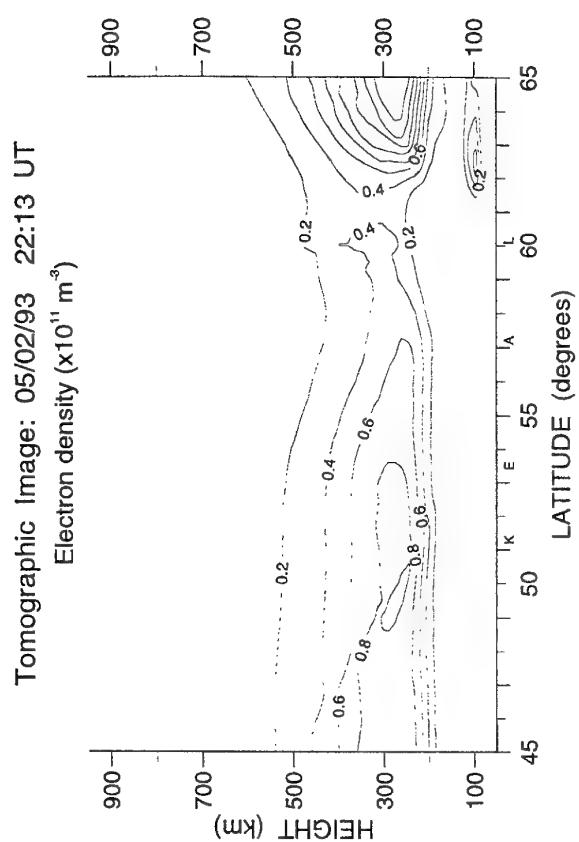
Tomographic Image: 05/02/93 18:47 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



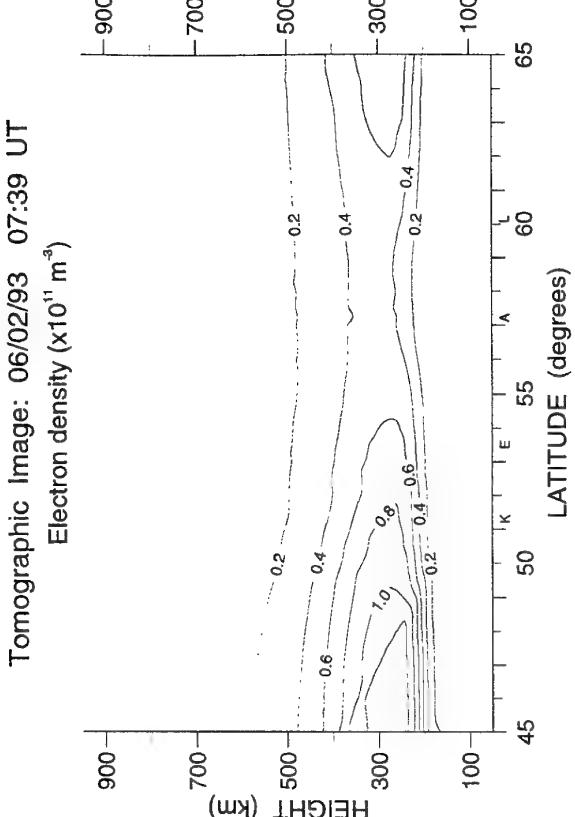
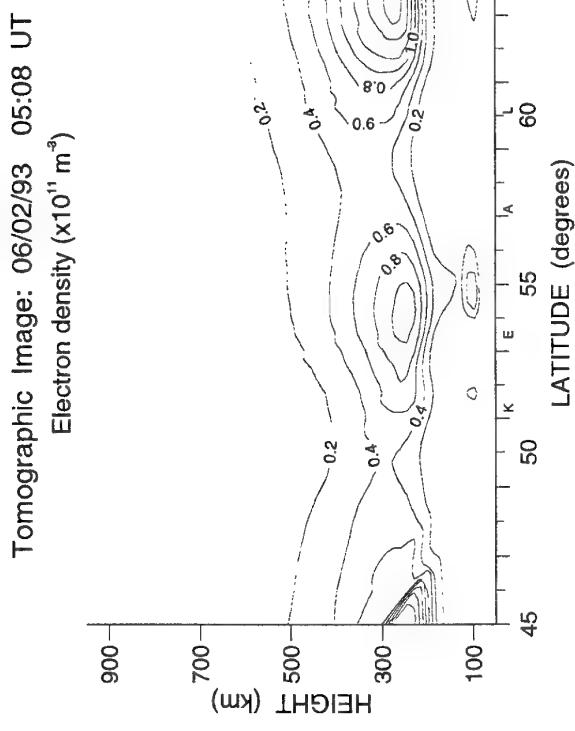
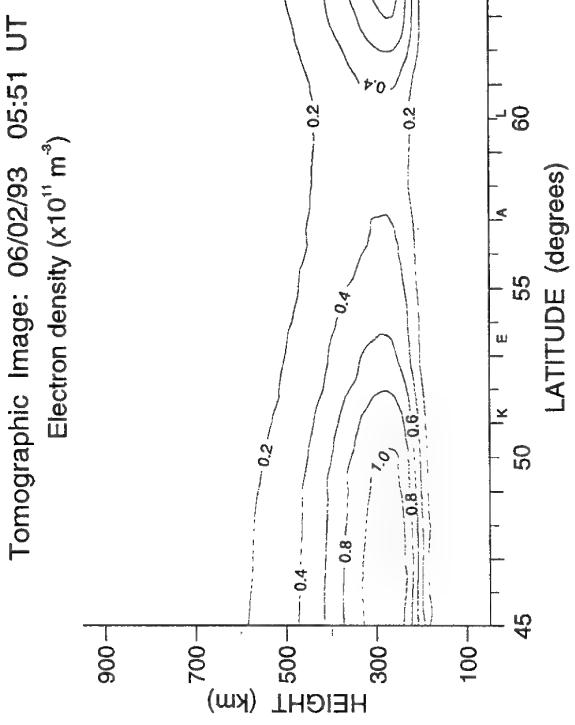
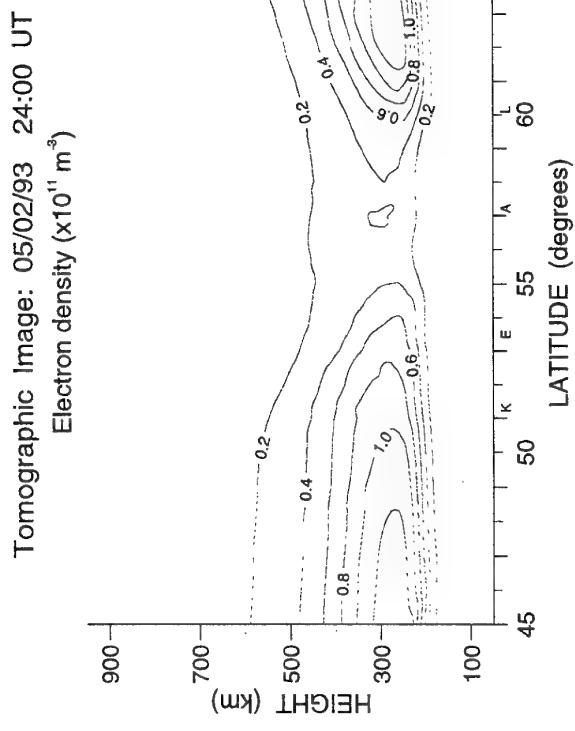
Tomographic Image: 05/02/93 21:03 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



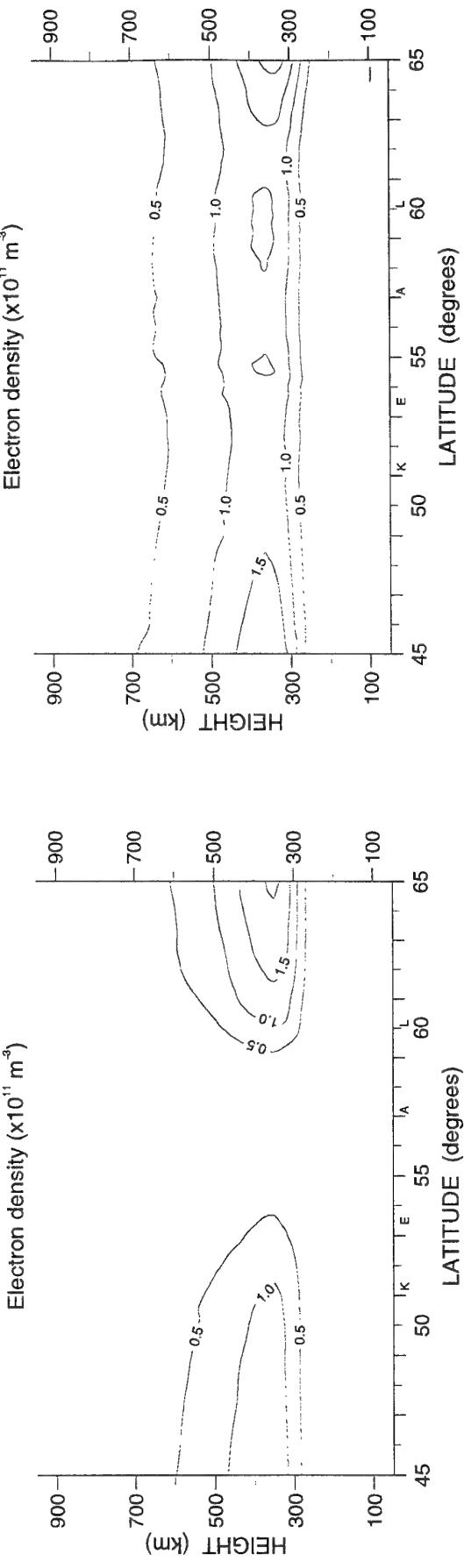
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Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



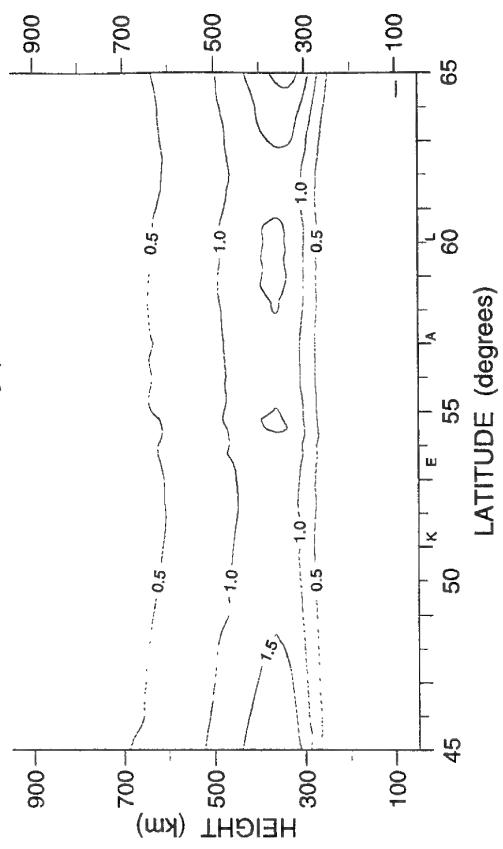
Tomographic Image: 05/02/93 22:13 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



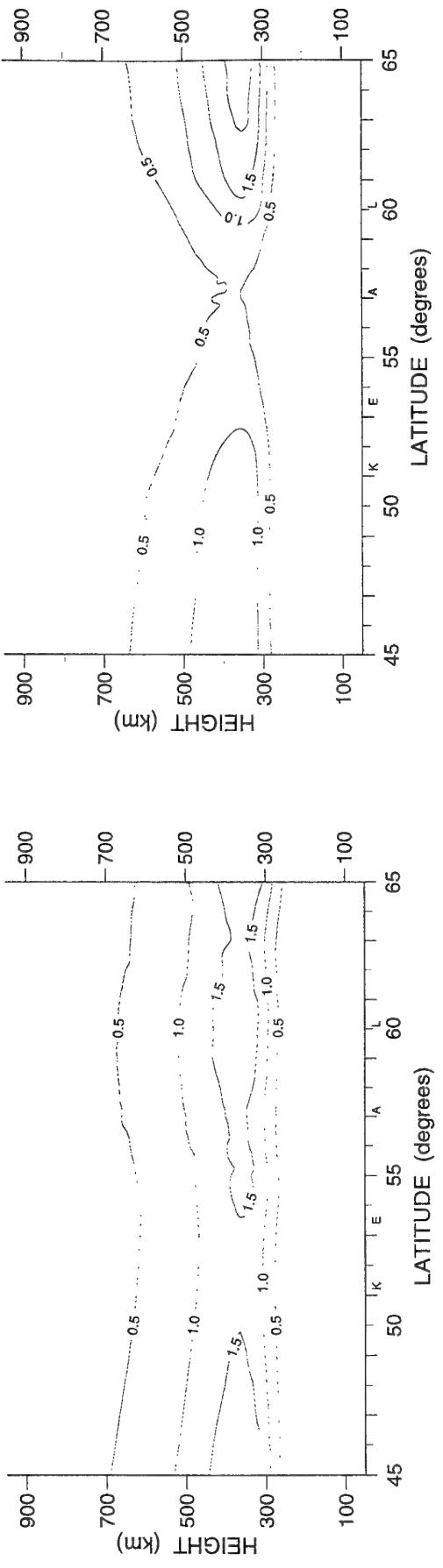
Tomographic Image: 10/02/93 22:46 UT



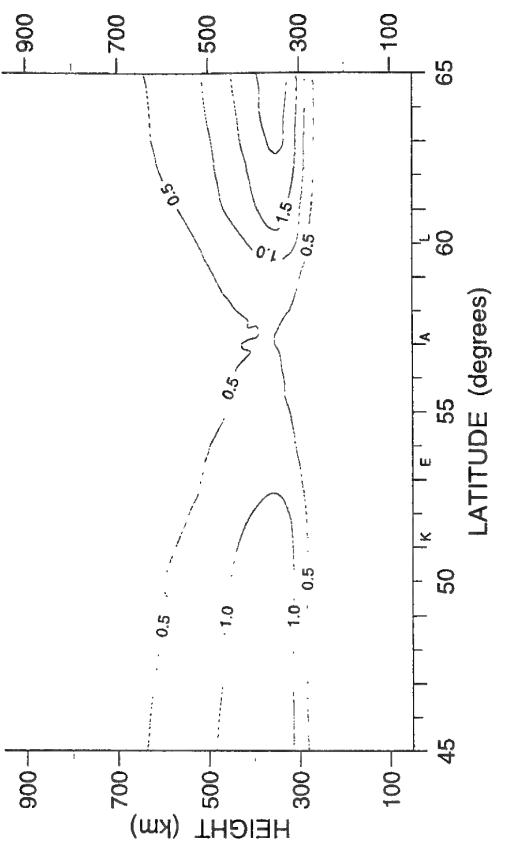
Tomographic Image: 10/03/93 22:39 UT

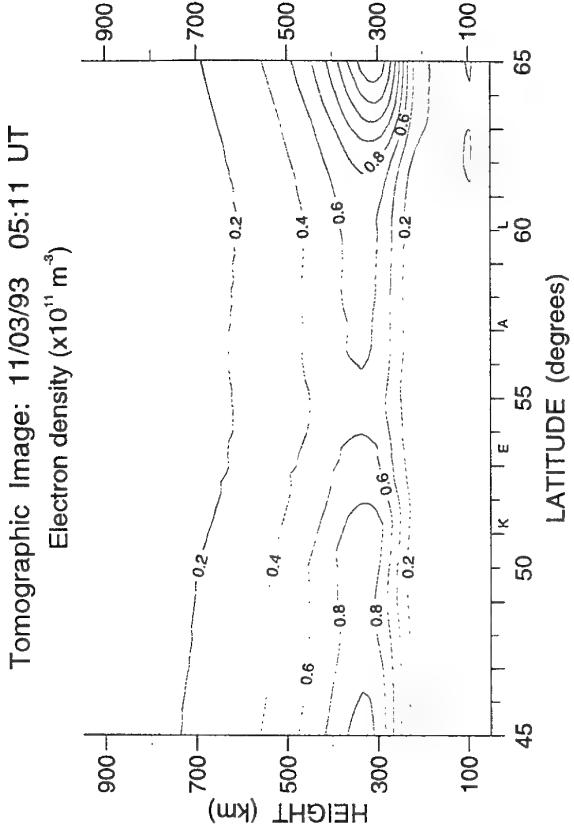
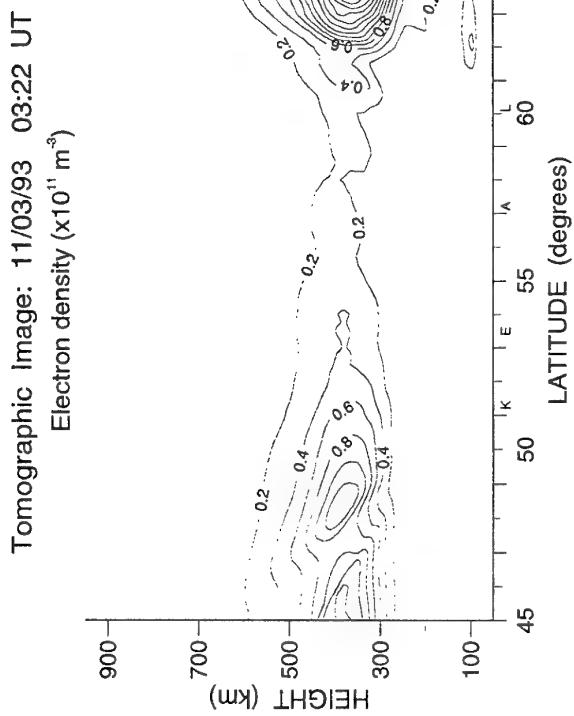
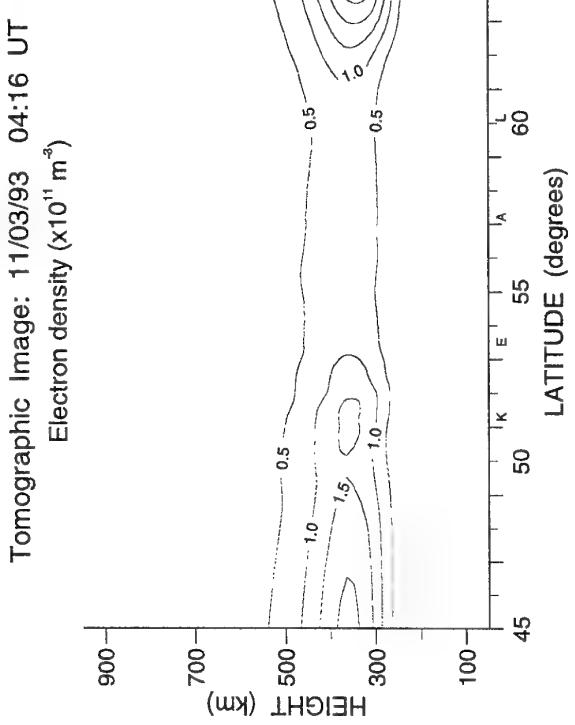
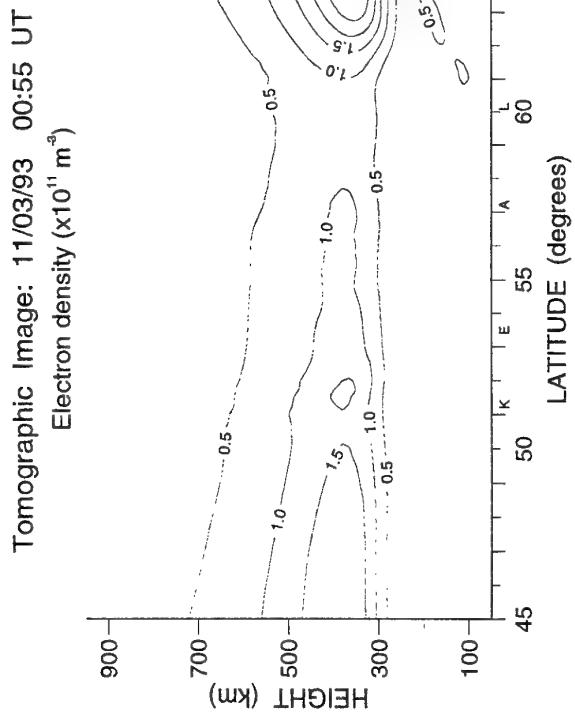


Tomographic Image: 10/03/93 22:09 UT

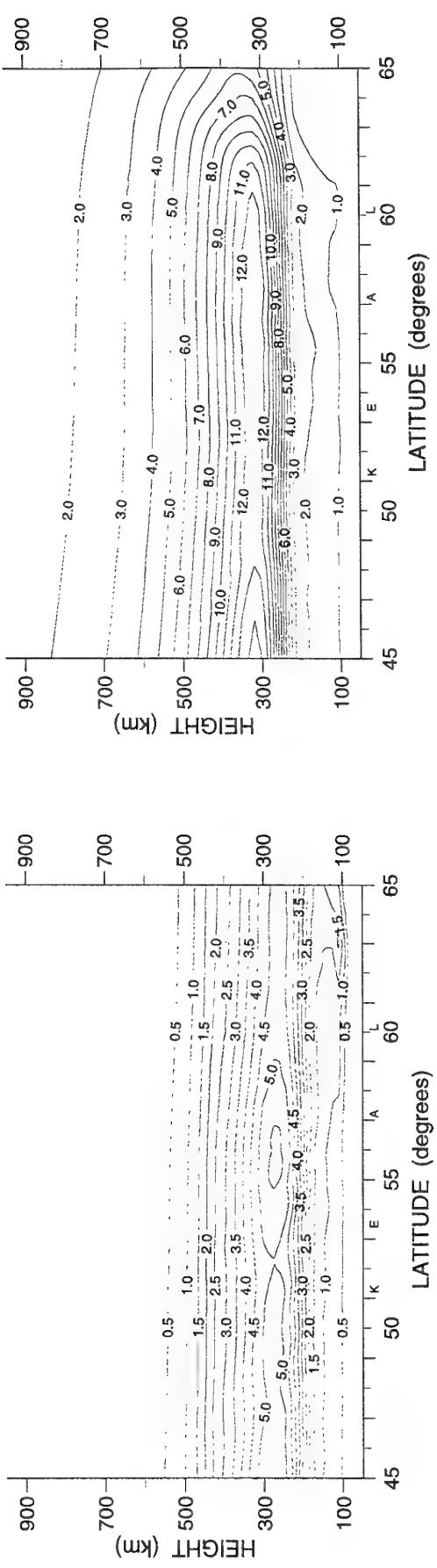


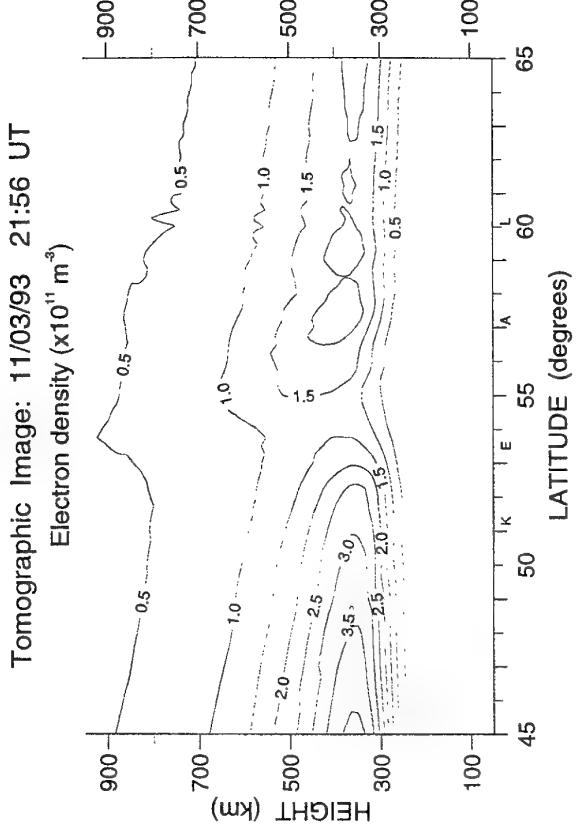
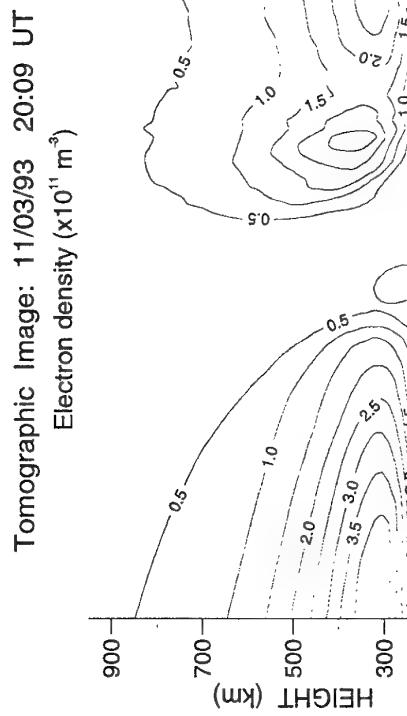
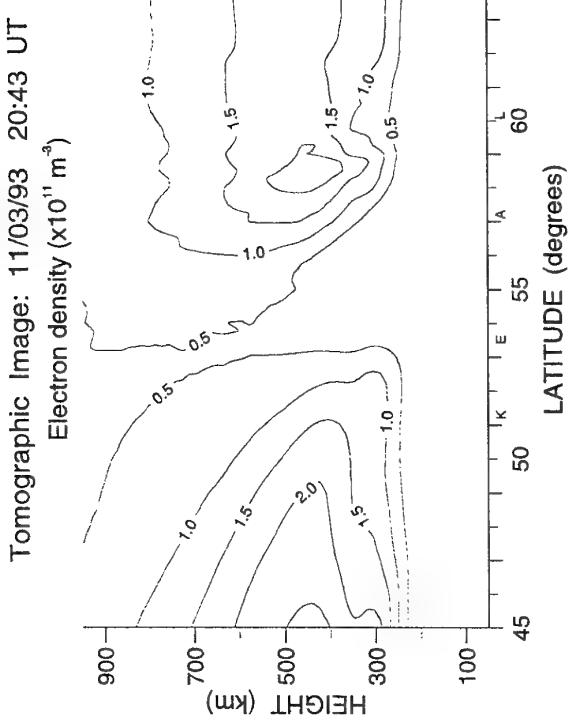
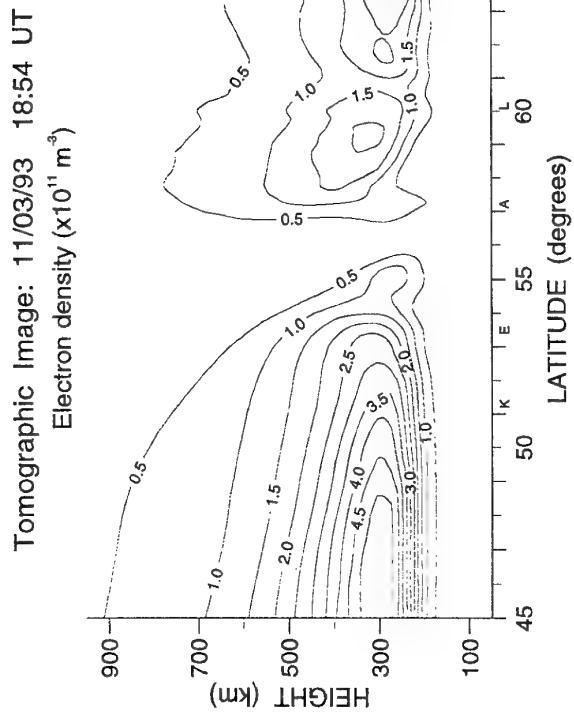
Tomographic Image: 10/02/93 22:46 UT



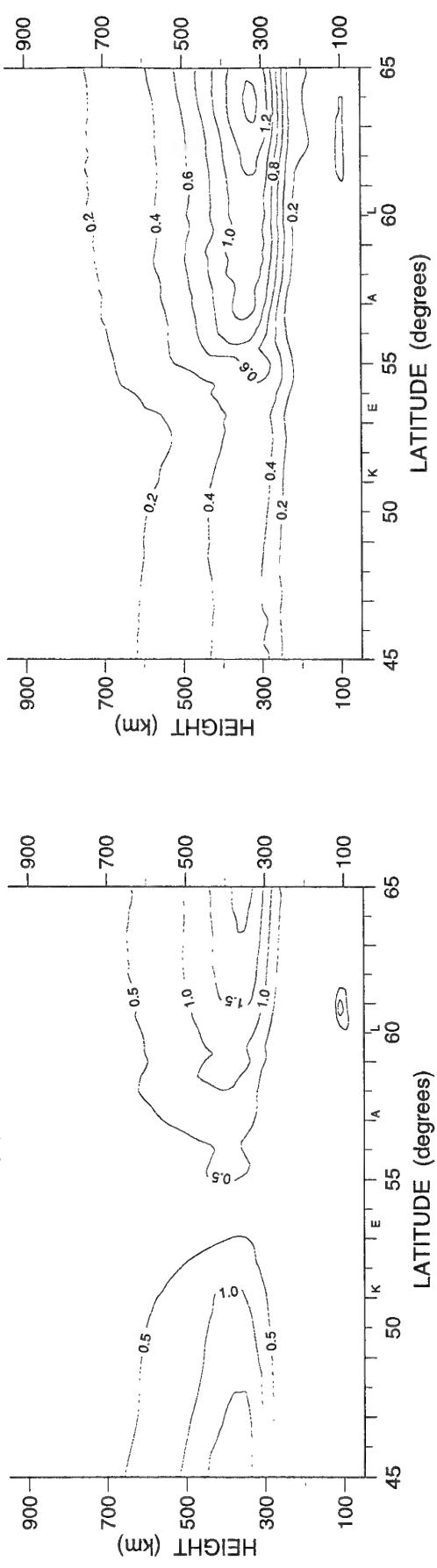


Tomographic Image: 11/03/93 08:21 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

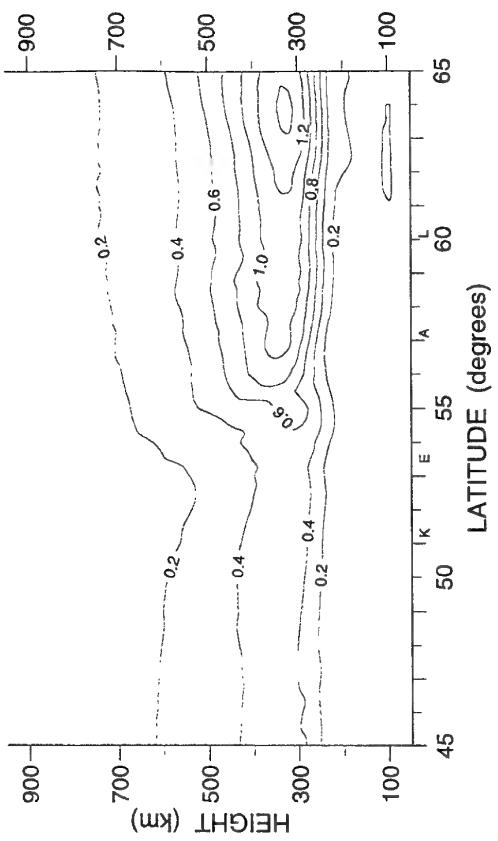




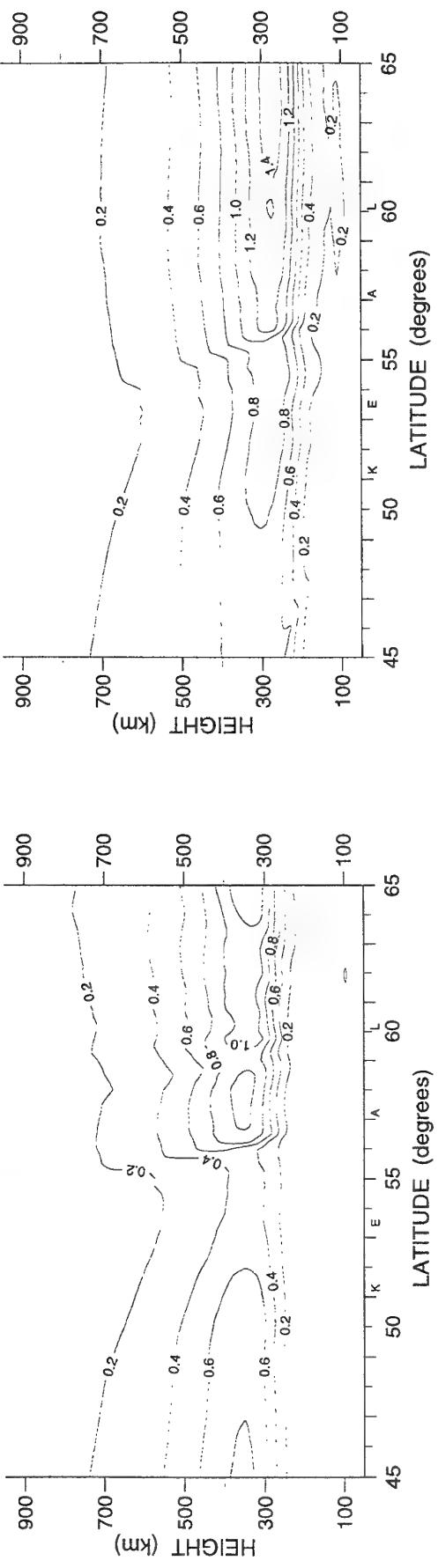
Tomographic Image: 12/03/93 00:27 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



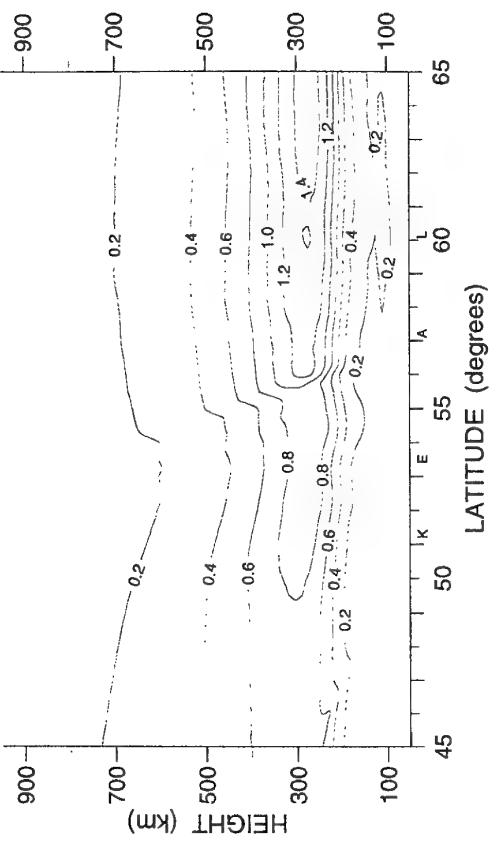
Tomographic Image: 12/03/93 05:18 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

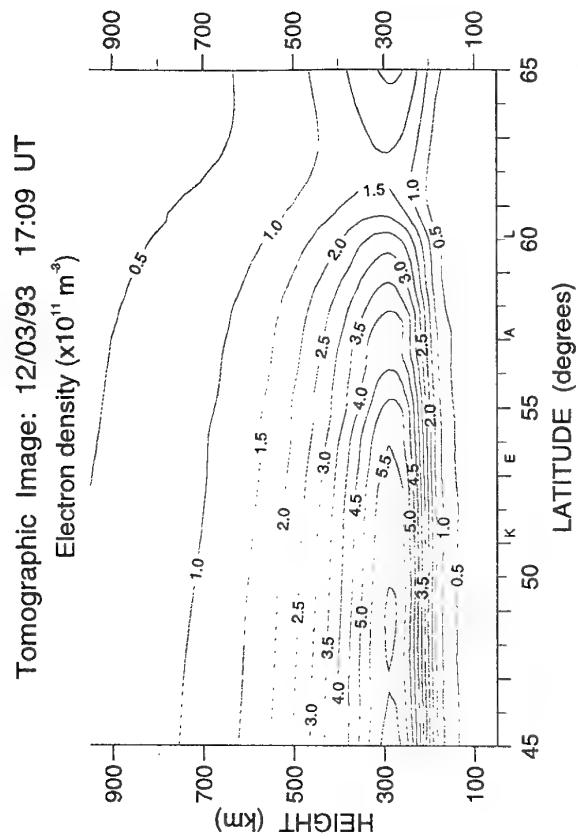
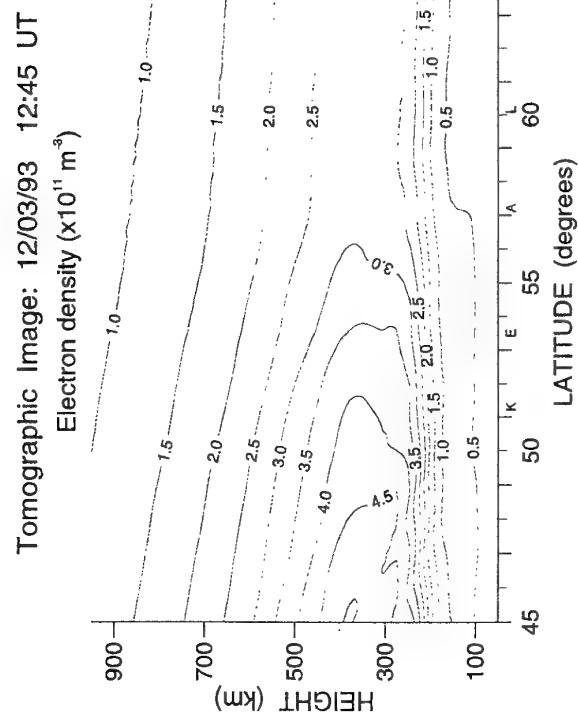
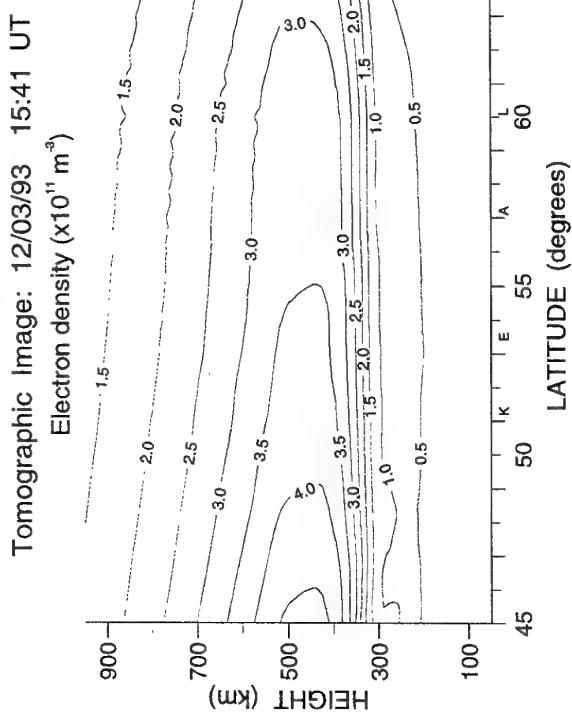
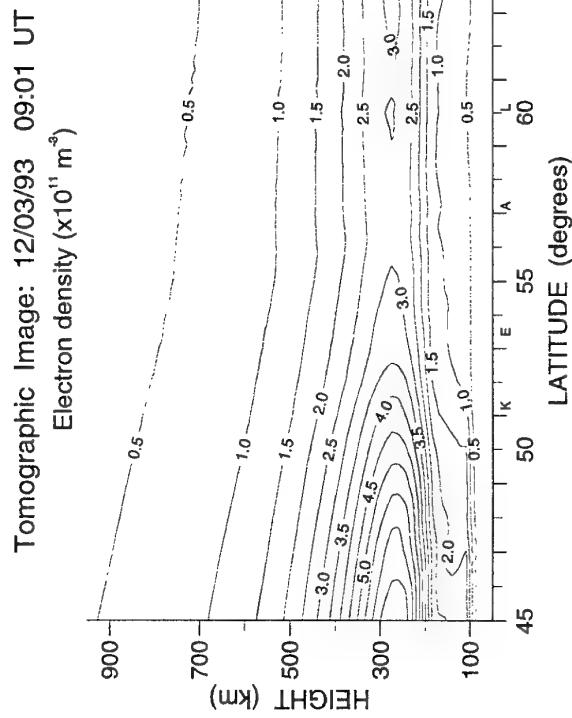


Tomographic Image: 12/03/93 04:48 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

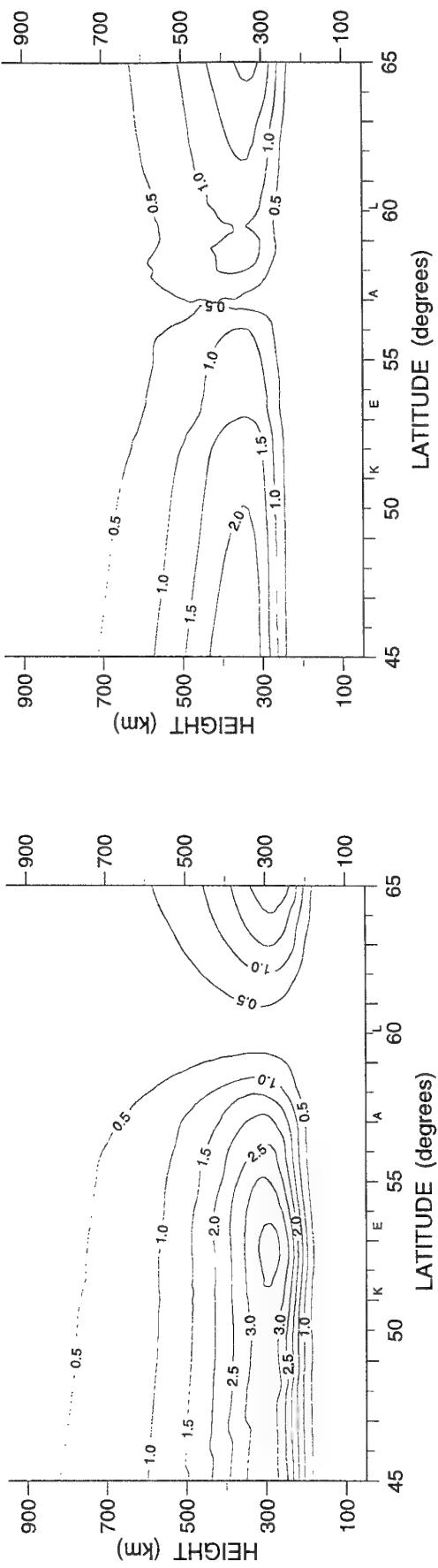


Tomographic Image: 12/03/93 06:37 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

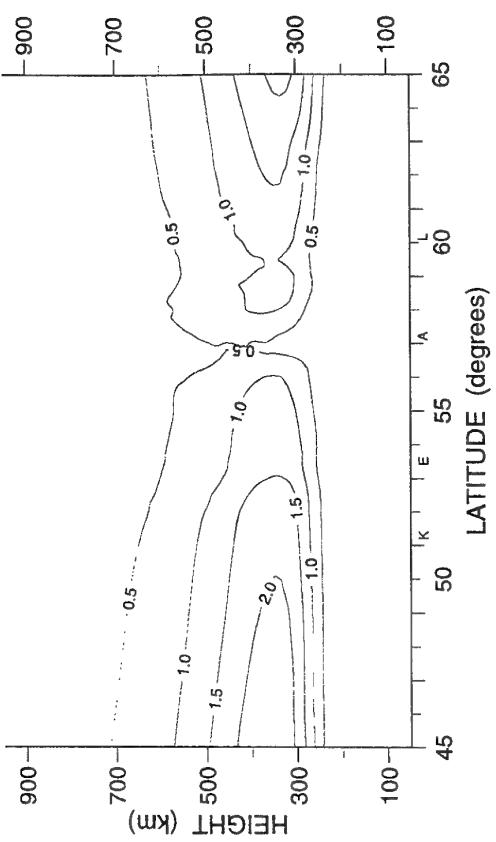




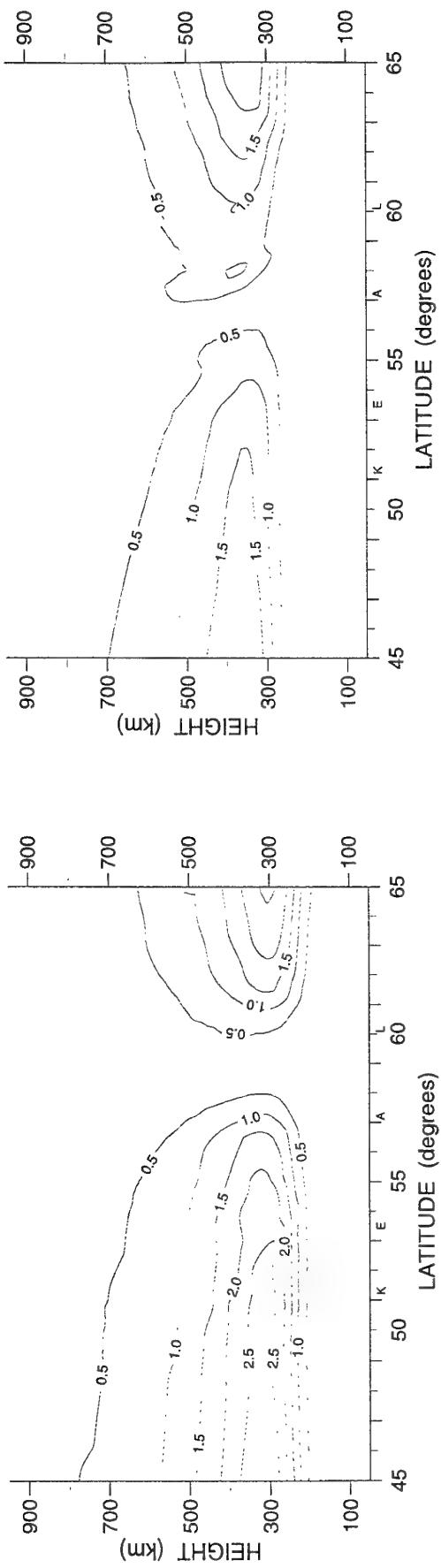
Tomographic Image: 12/03/93 18:31 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



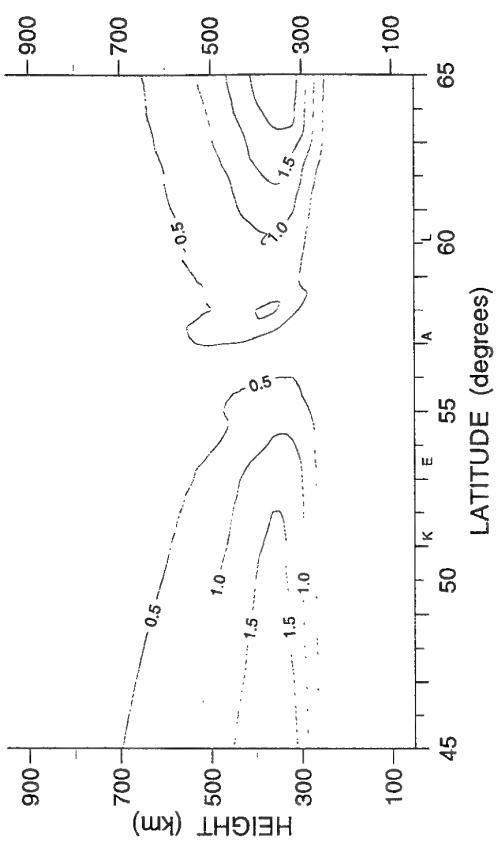
Tomographic Image: 12/03/93 21:13 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

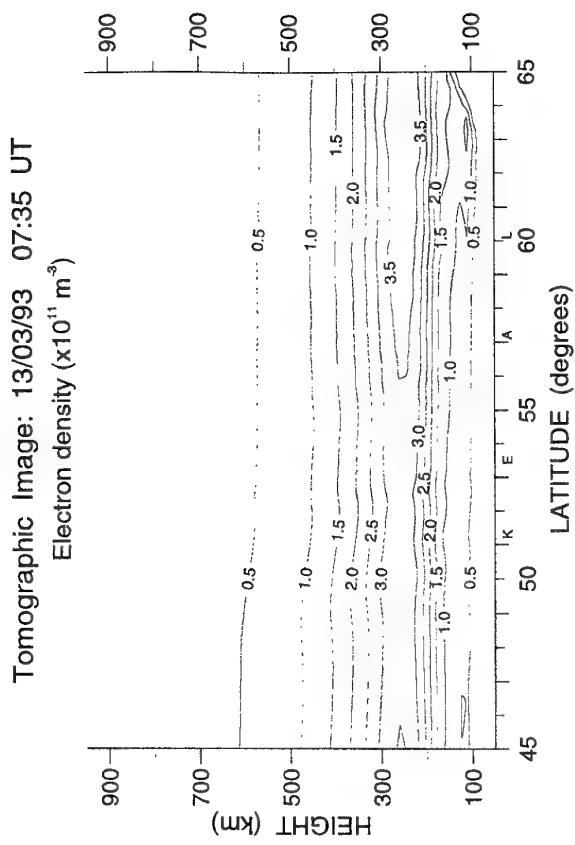
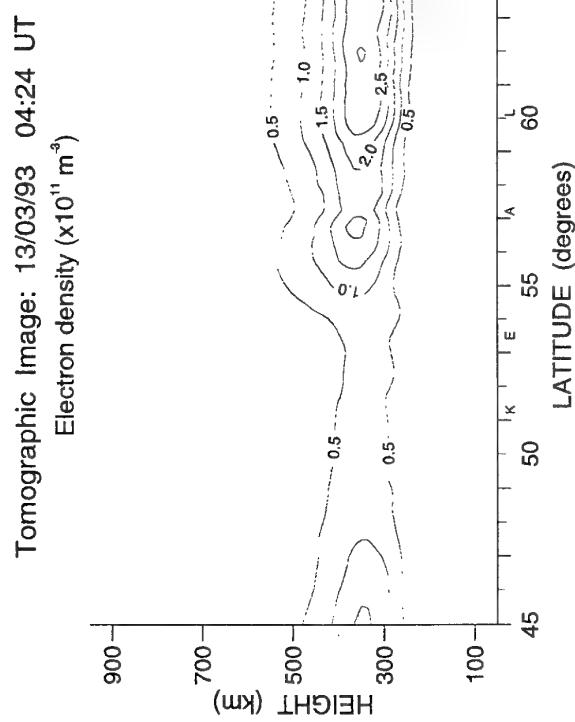
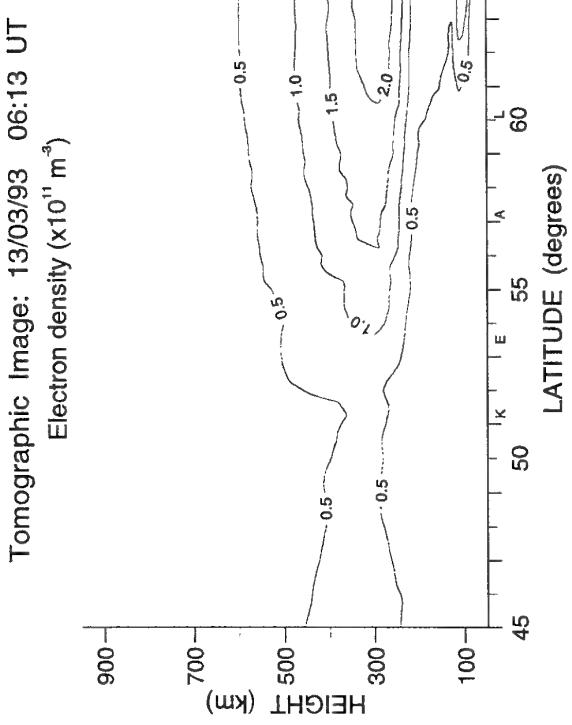
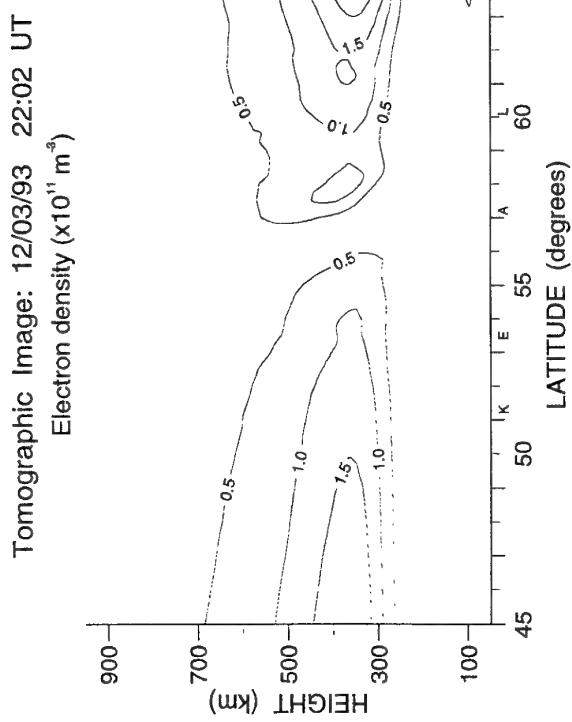


Tomographic Image: 12/03/93 19:48 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

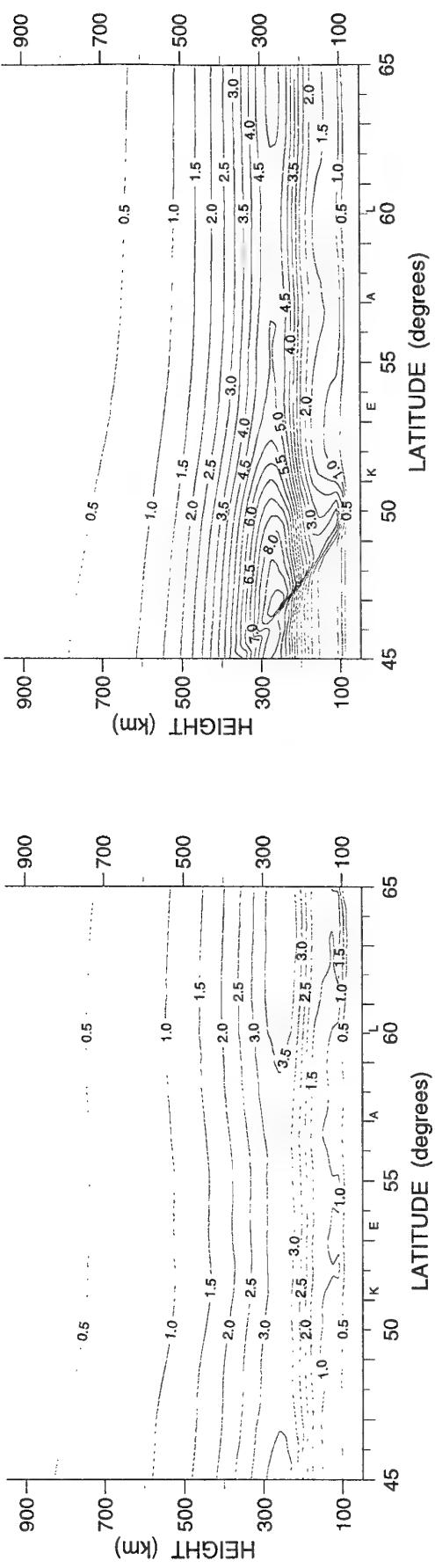


Tomographic Image: 12/03/93 21:34 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

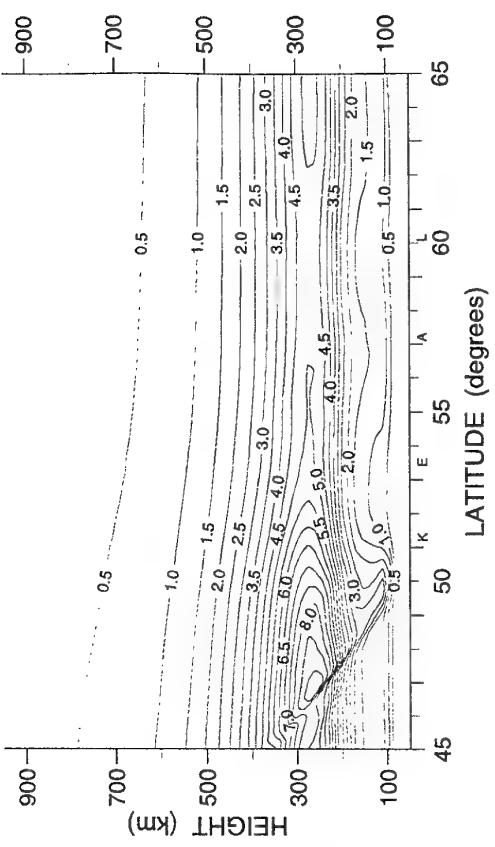




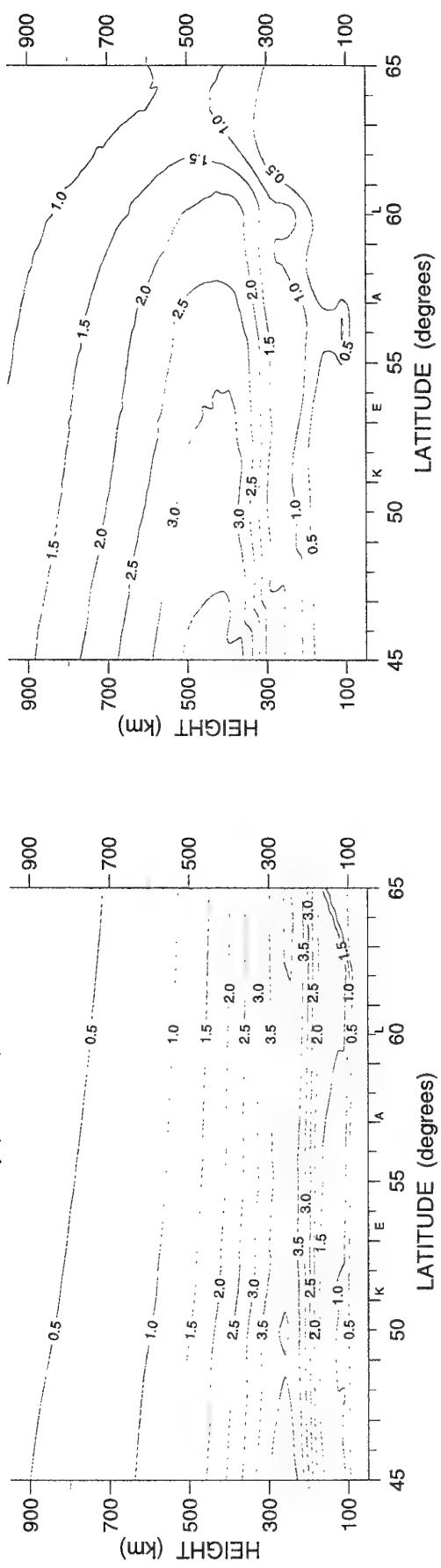
Tomographic Image: 13/03/93 08:18 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



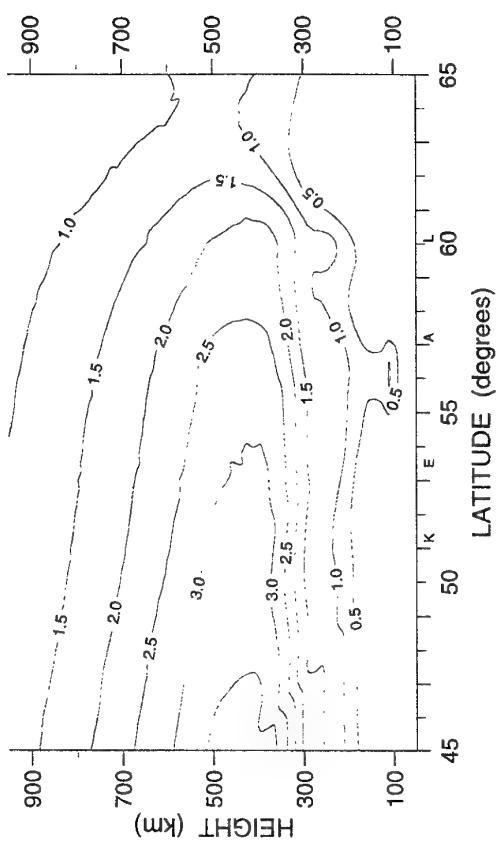
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Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



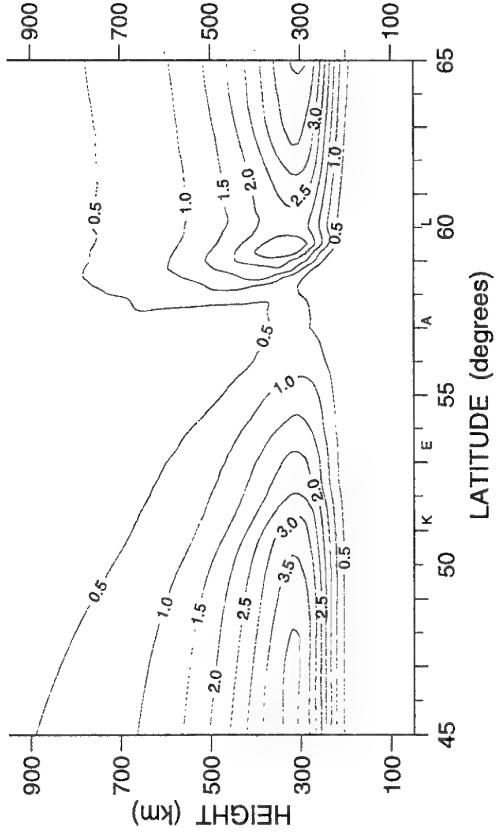
Tomographic Image: 13/03/93 09:07 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



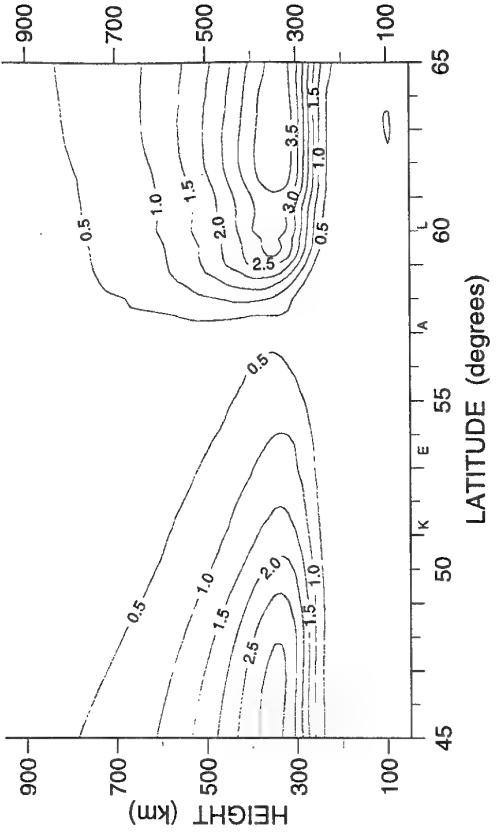
Tomographic Image: 13/03/93 16:46 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



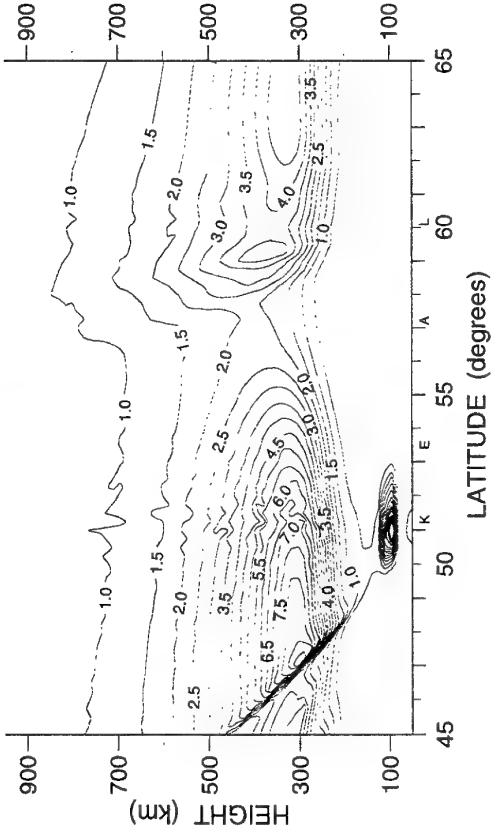
Tomographic Image: 13/03/93 19:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



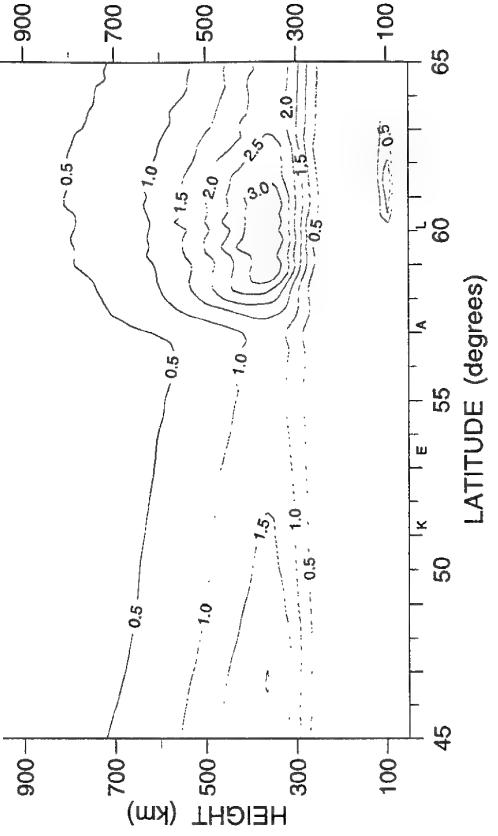
Tomographic Image: 13/03/93 21:19 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



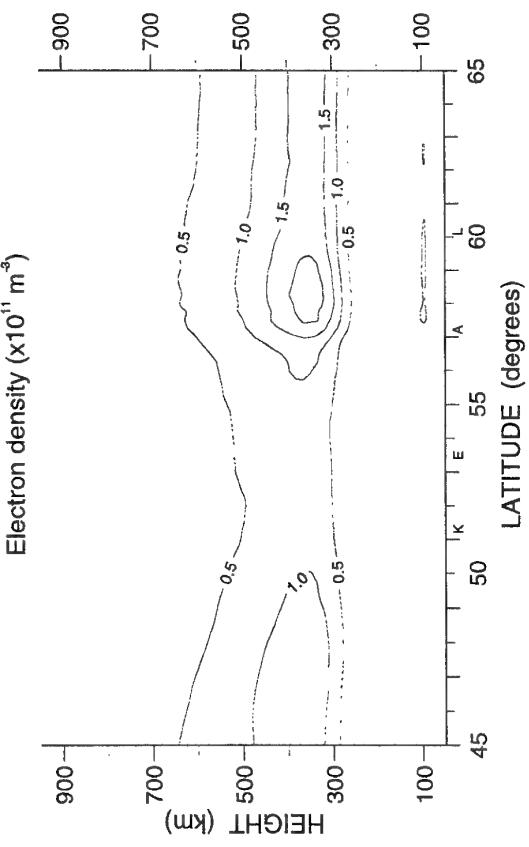
Tomographic Image: 13/03/93 20:23 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



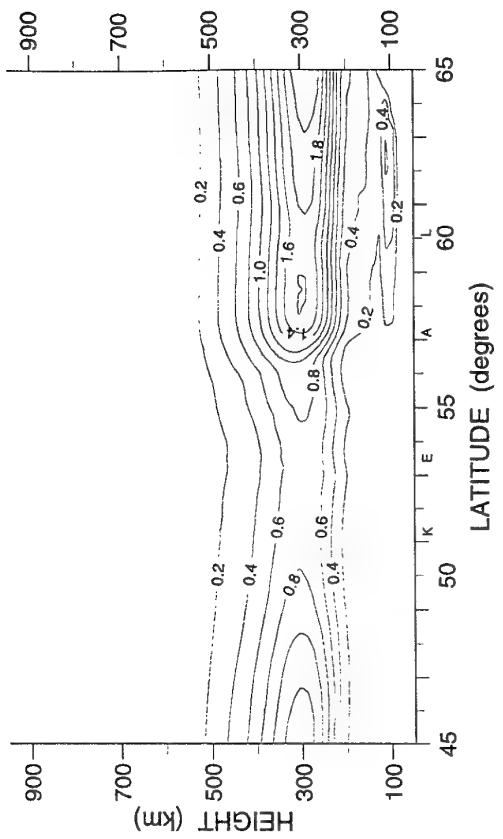
Tomographic Image: 13/03/93 23:31 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



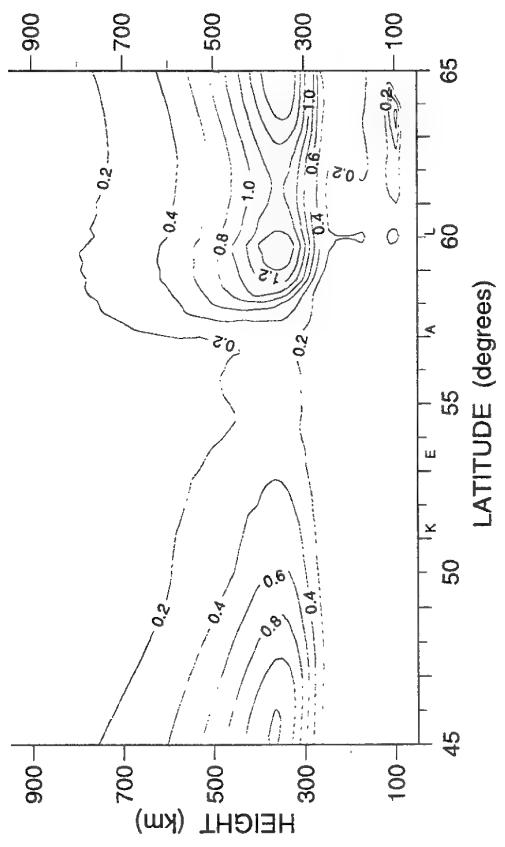
Tomographic Image: 14/03/93 01:20 UT



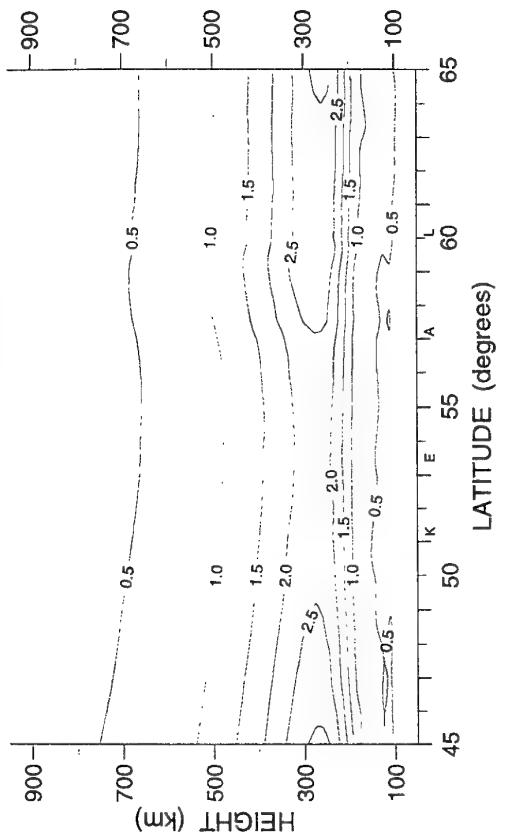
Tomographic Image: 14/03/93 05:50 UT



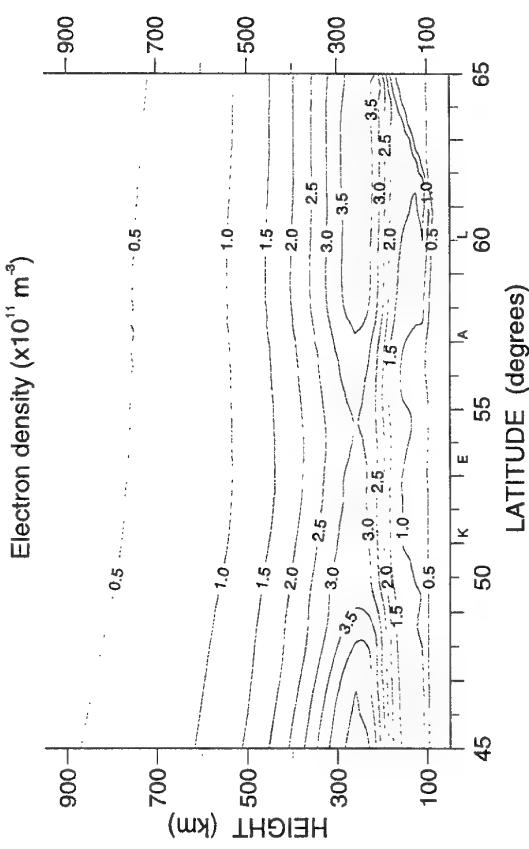
Tomographic Image: 14/03/93 03:48 UT



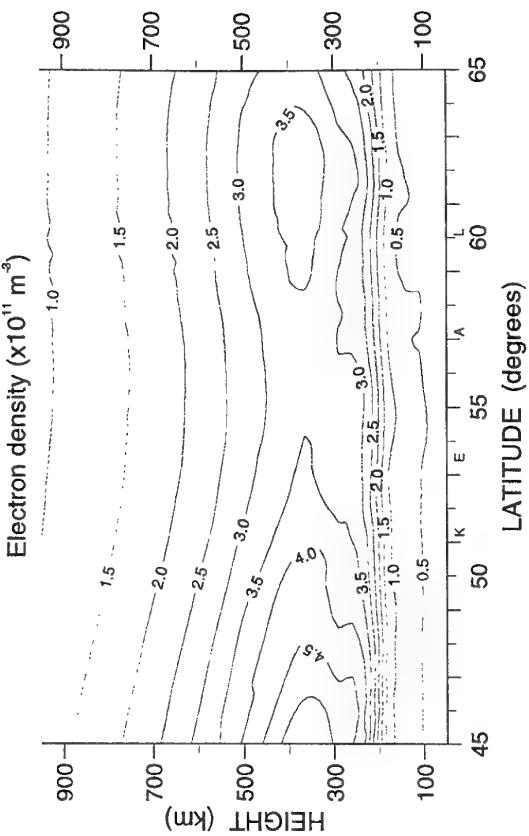
Tomographic Image: 14/03/93 07:12 UT



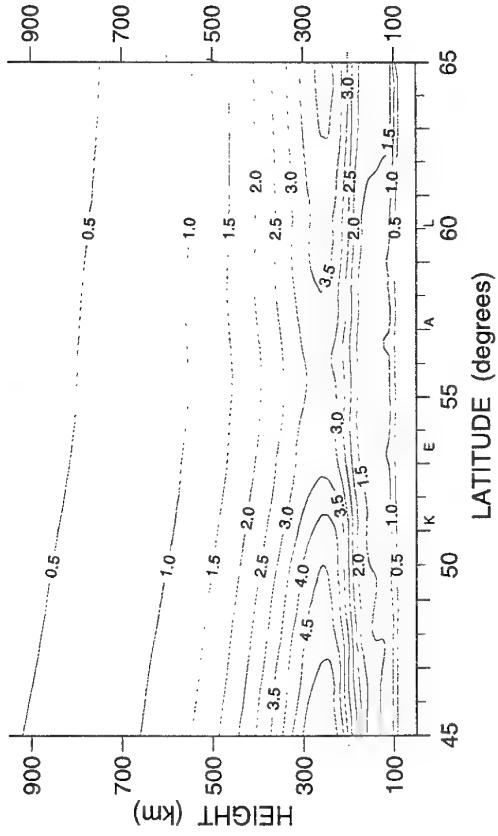
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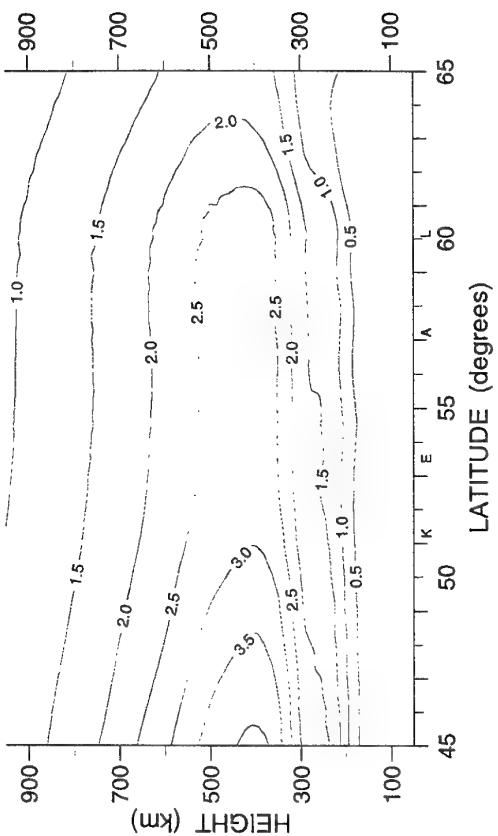
Tomographic Image: 14/03/93 13:38 UT

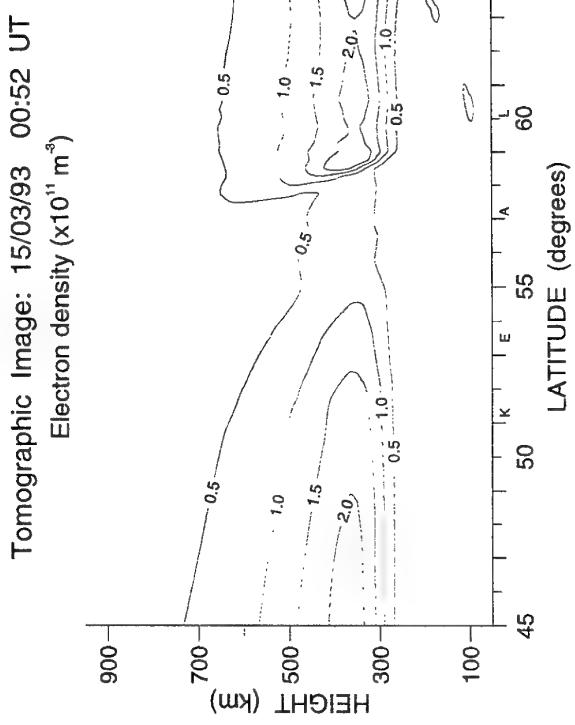
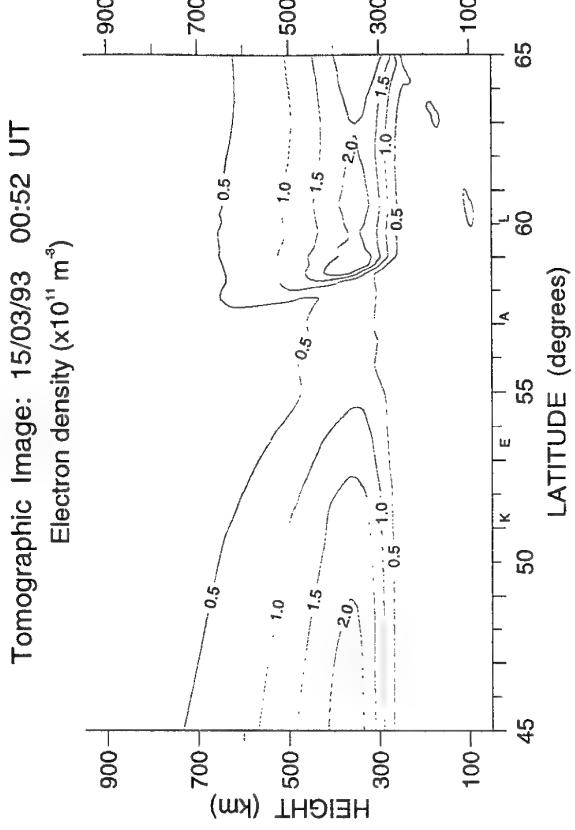
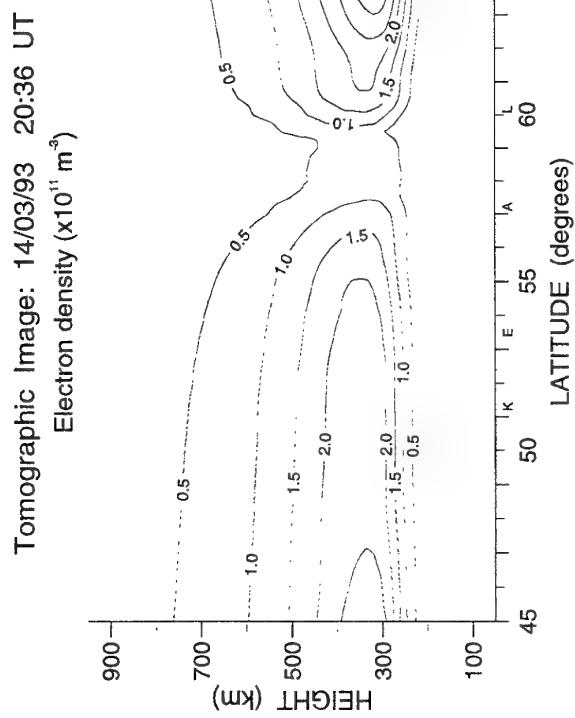
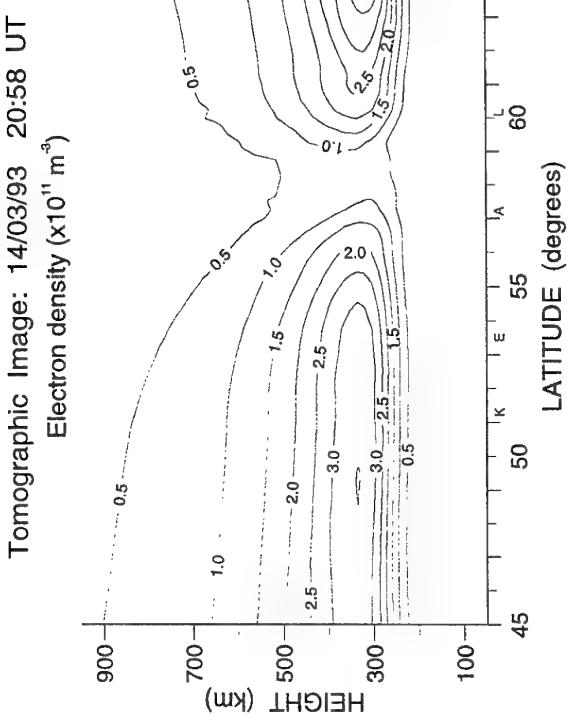
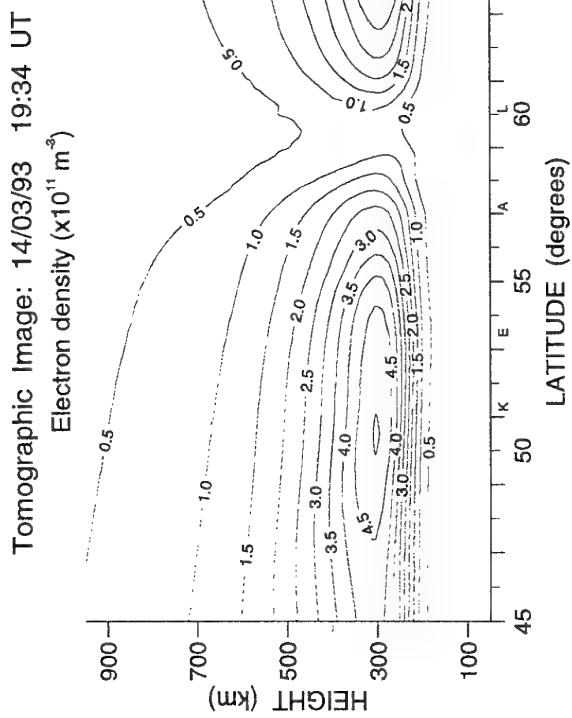


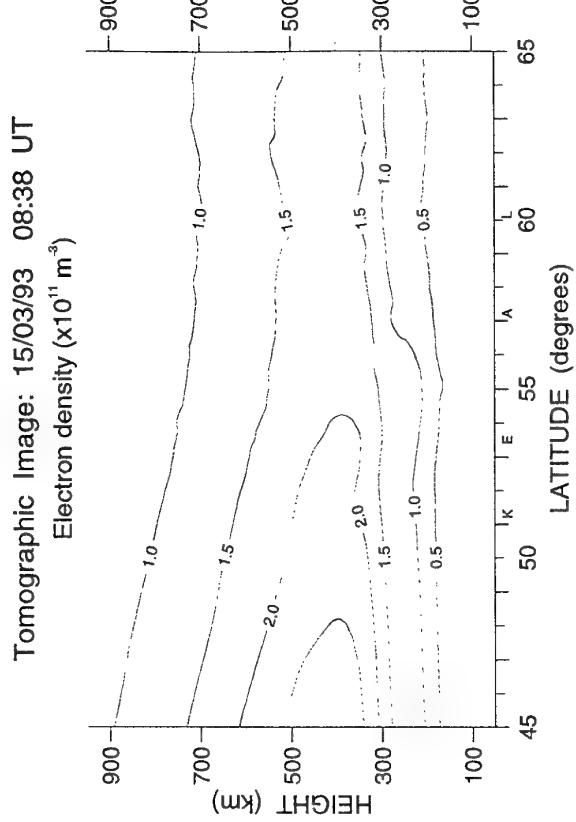
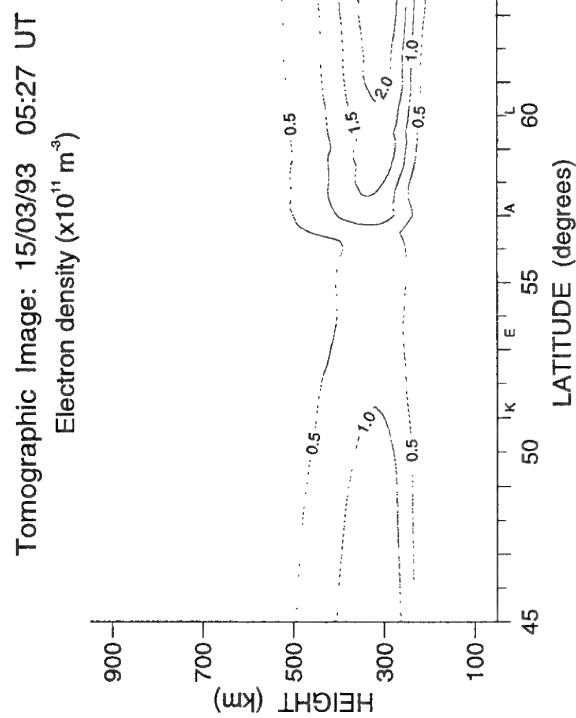
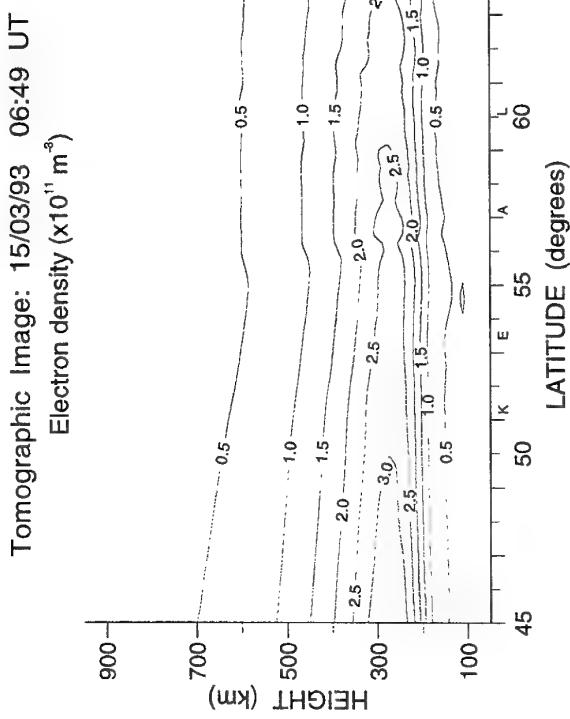
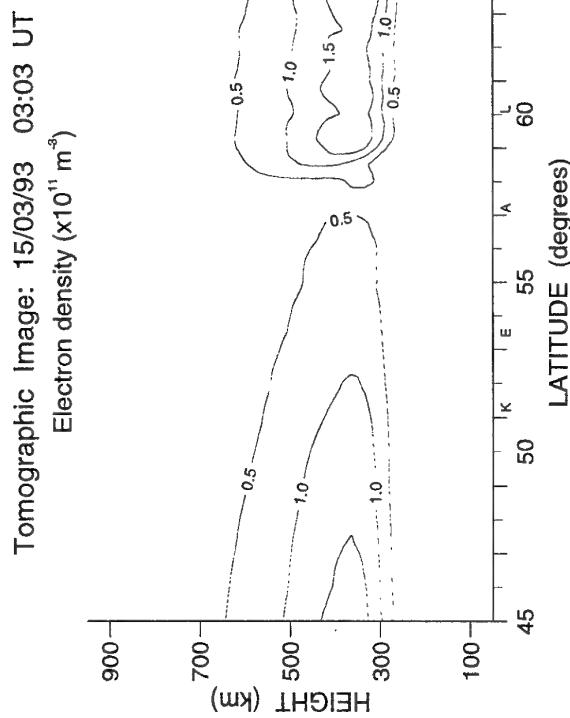
Tomographic Image: 14/03/93 09:23 UT

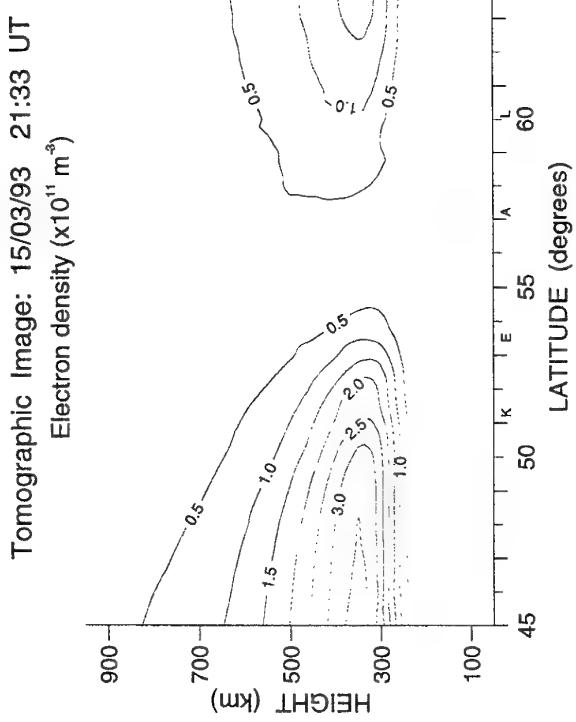
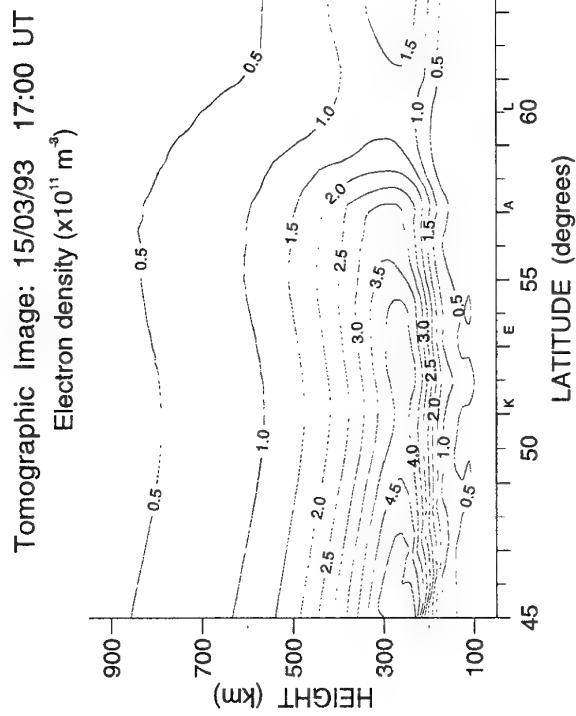
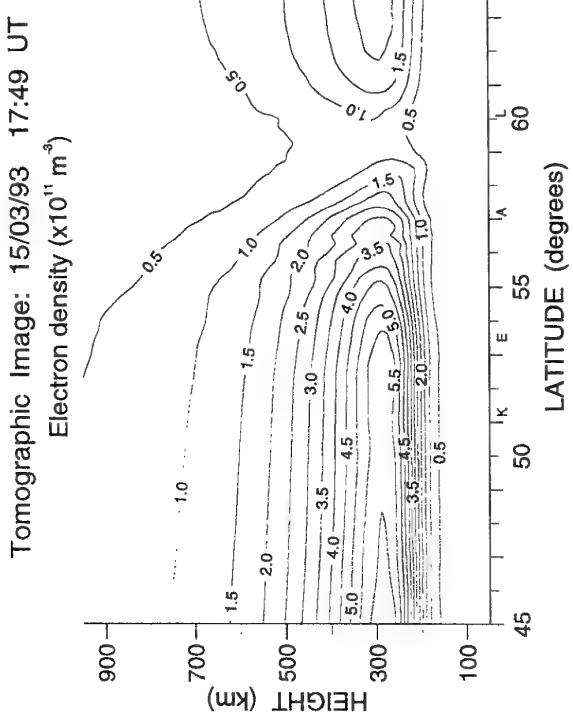
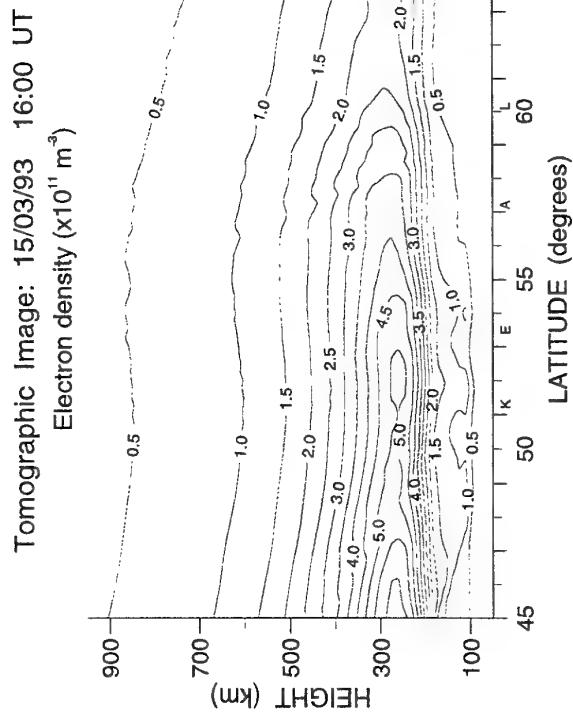


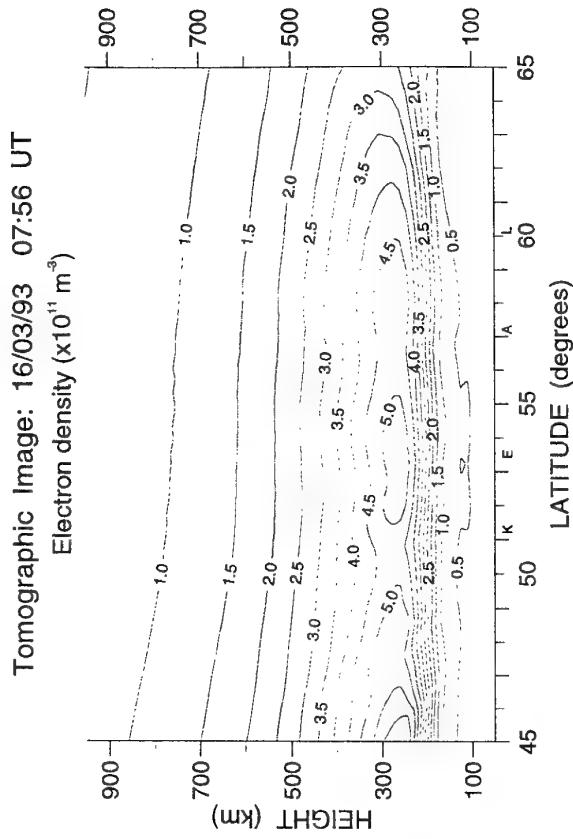
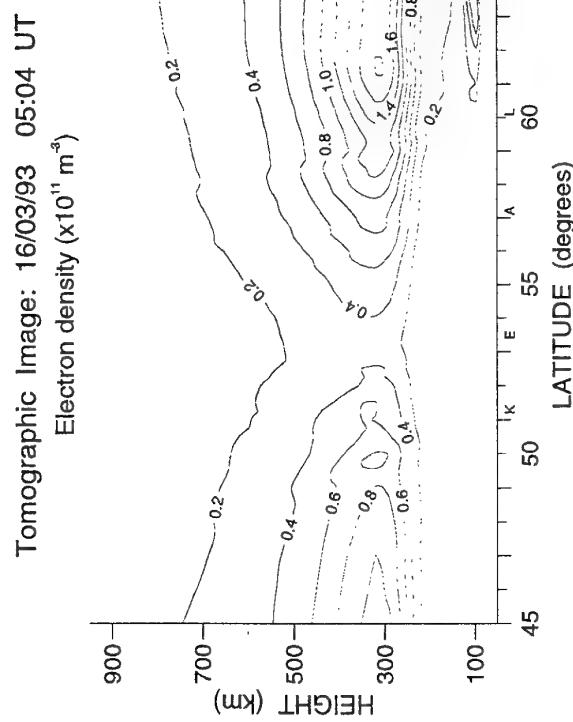
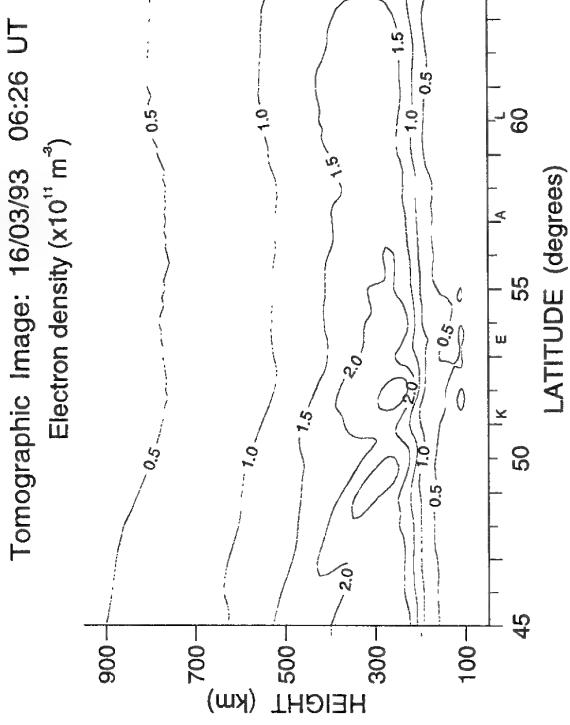
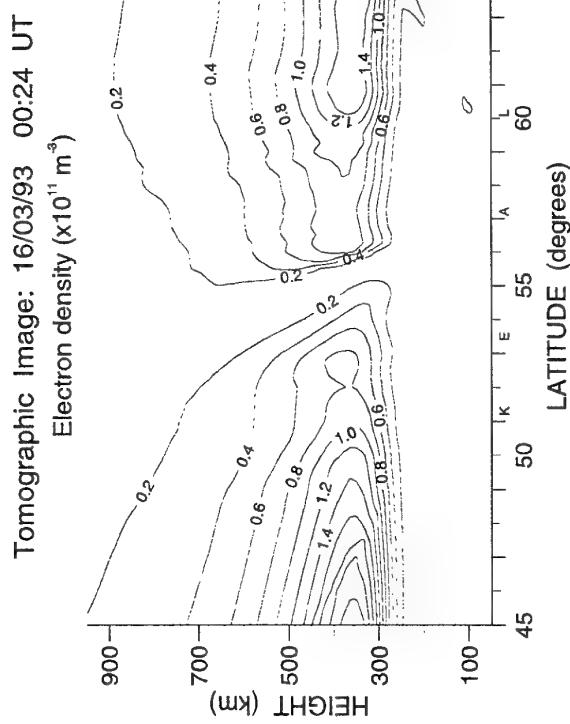
Tomographic Image: 14/03/93 16:23 UT

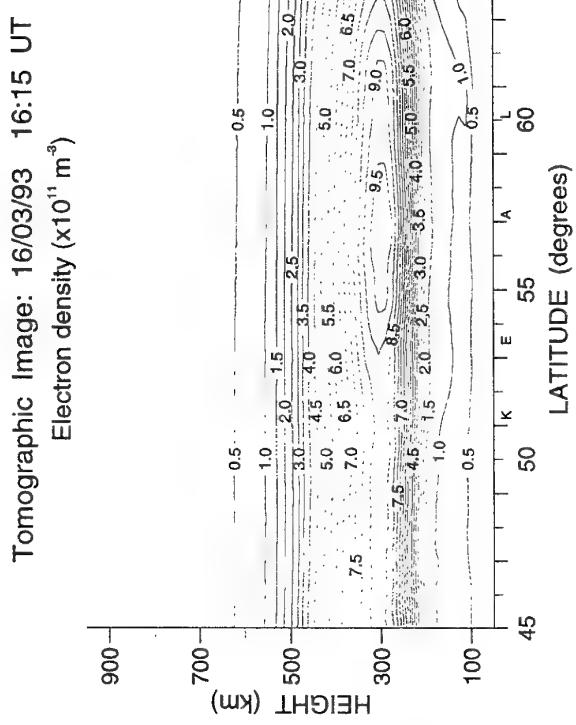
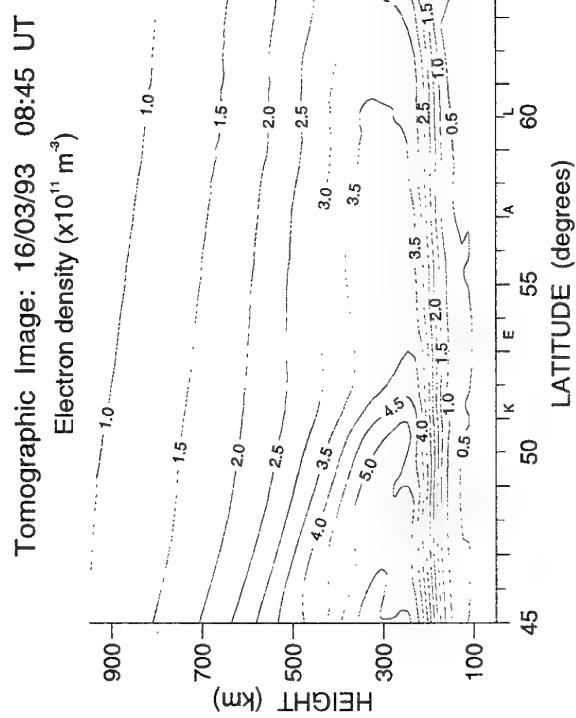
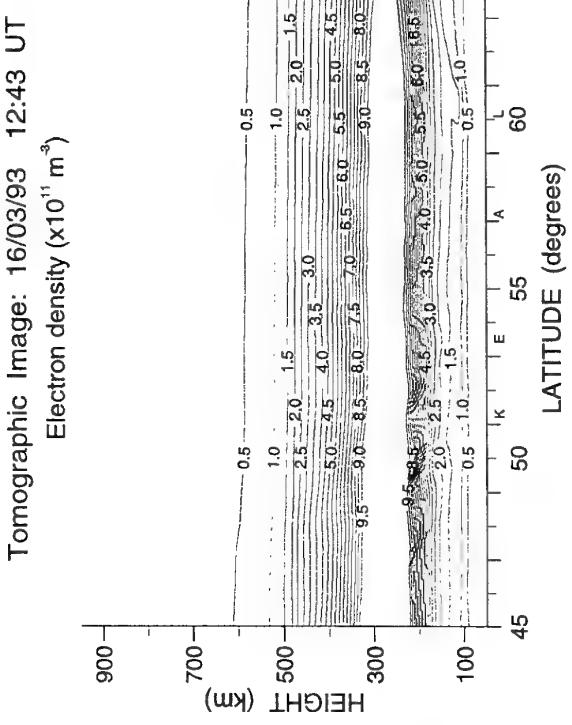
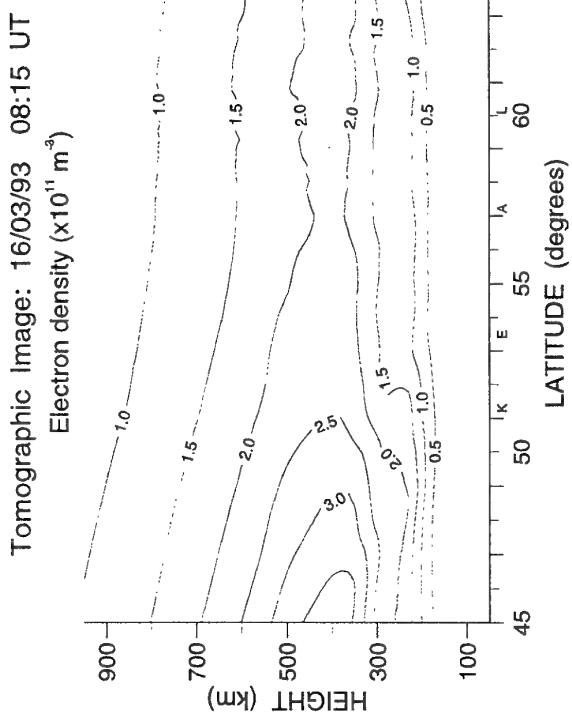


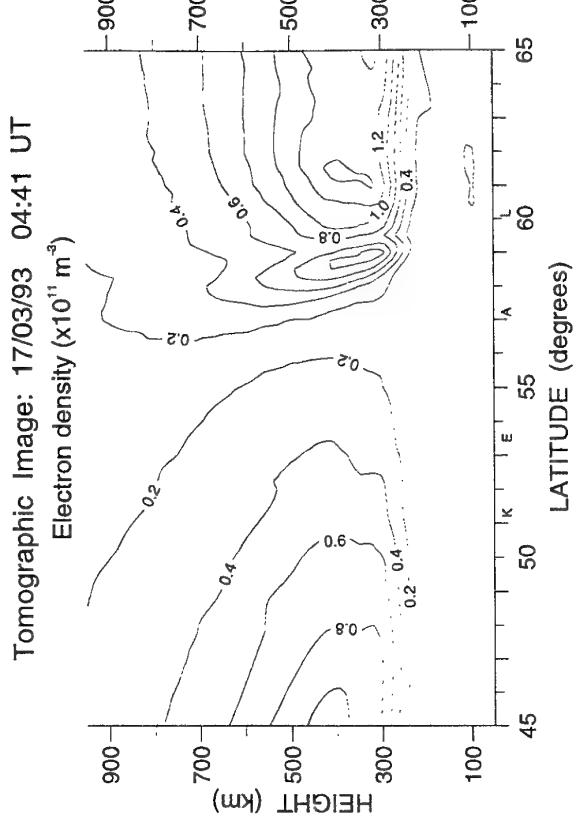
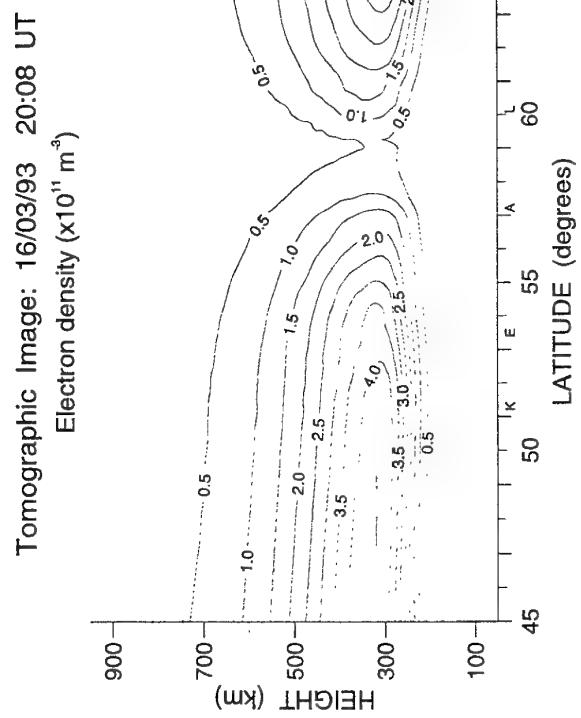
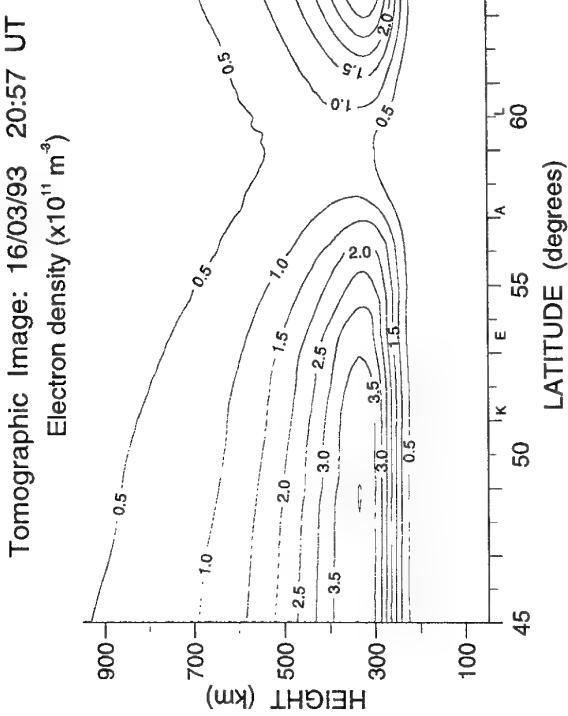
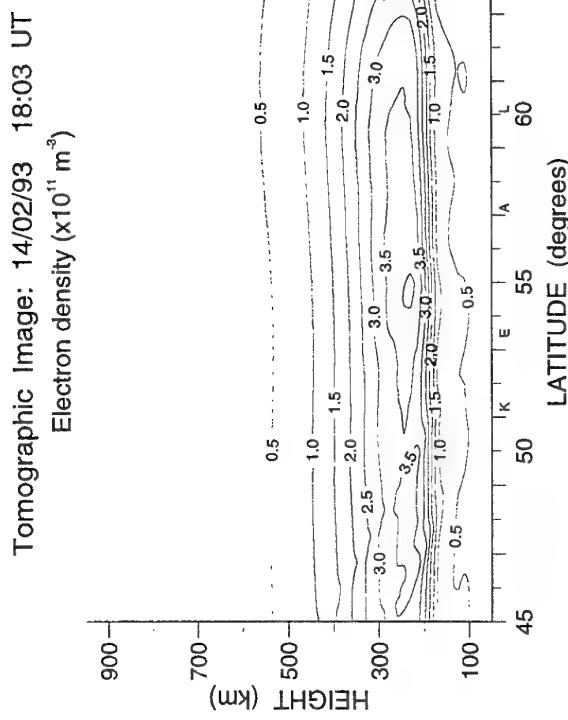




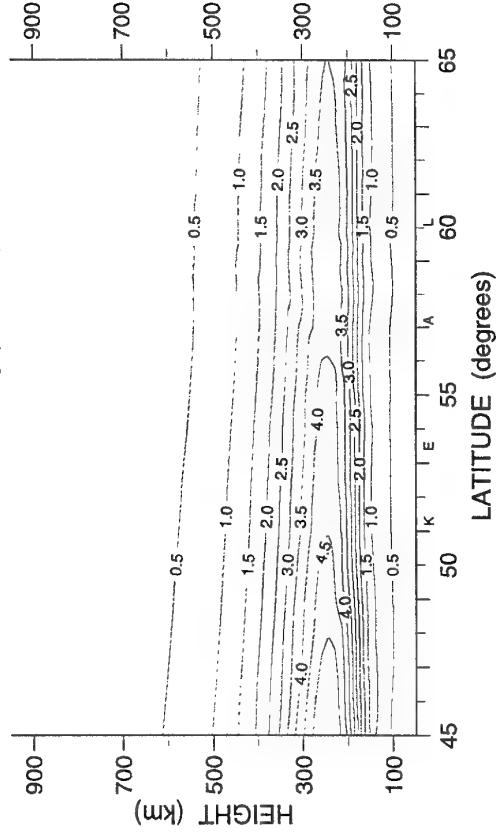




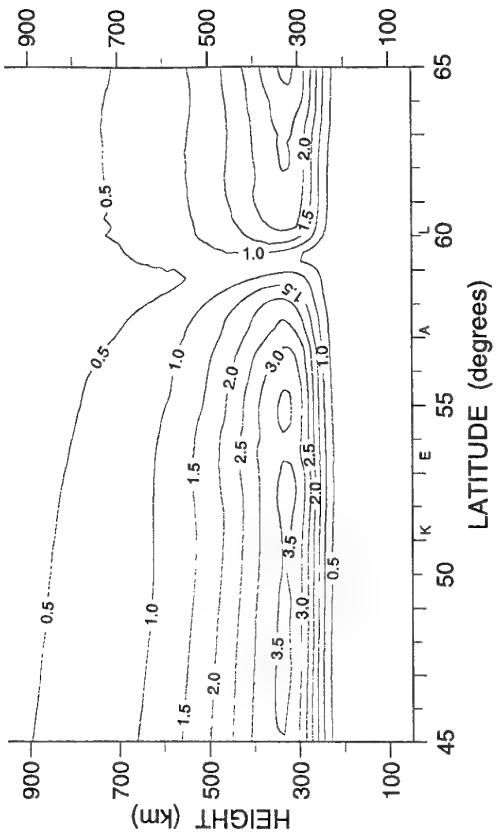




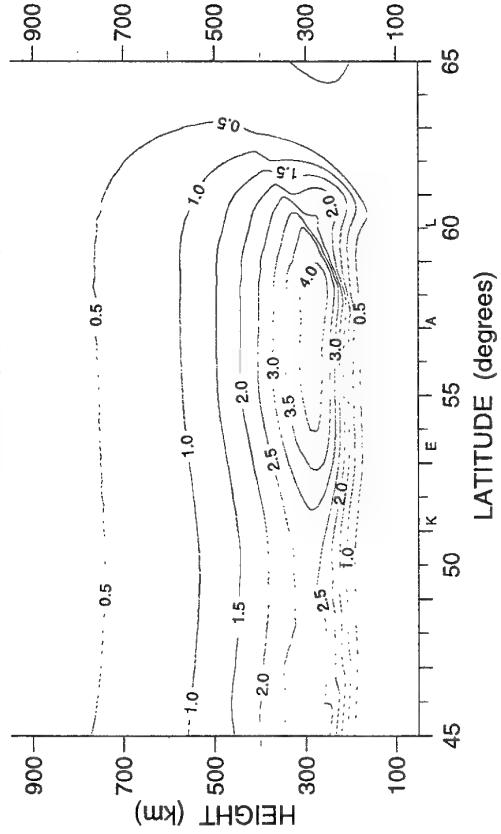
Tomographic Image: 17/03/93 07:52 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



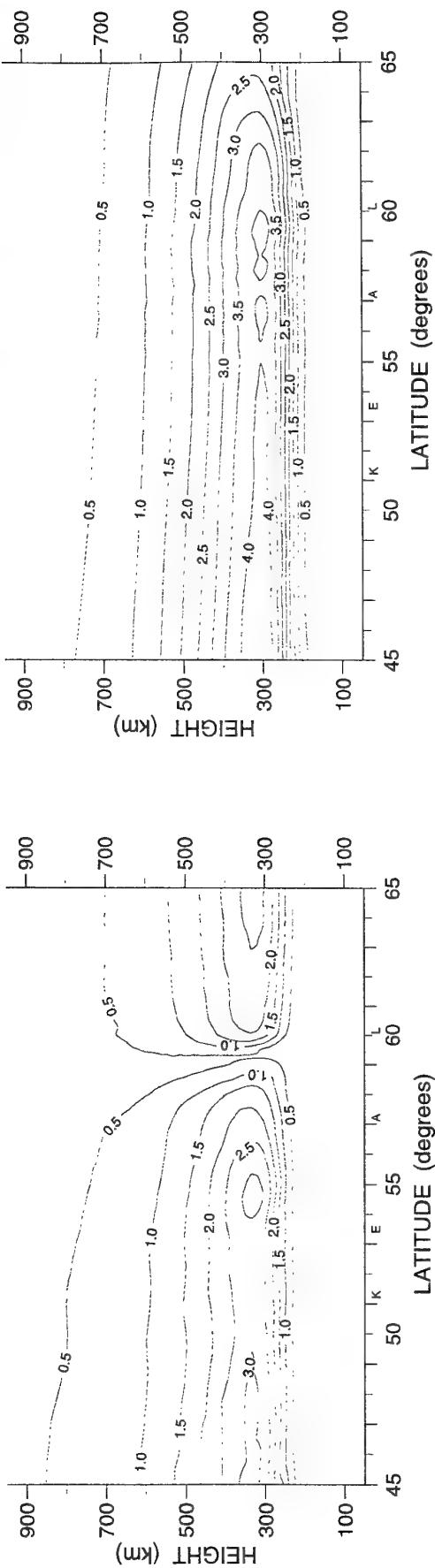
Tomographic Image: 17/03/93 20:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



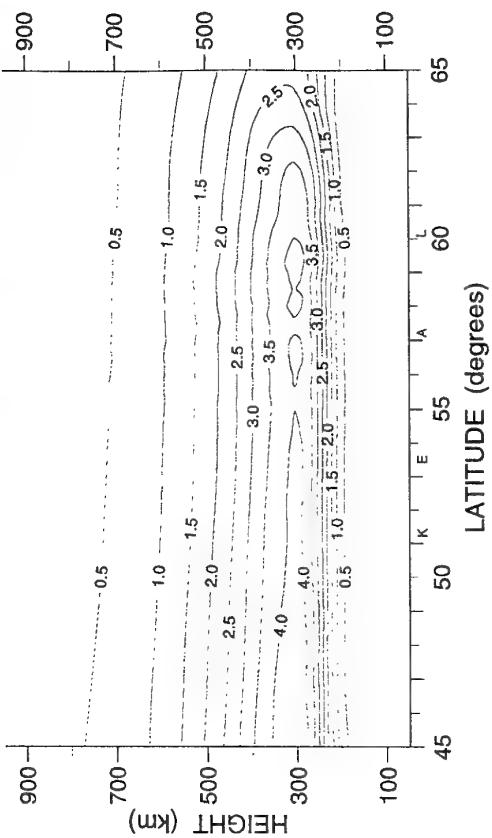
Tomographic Image: 17/03/93 18:25 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



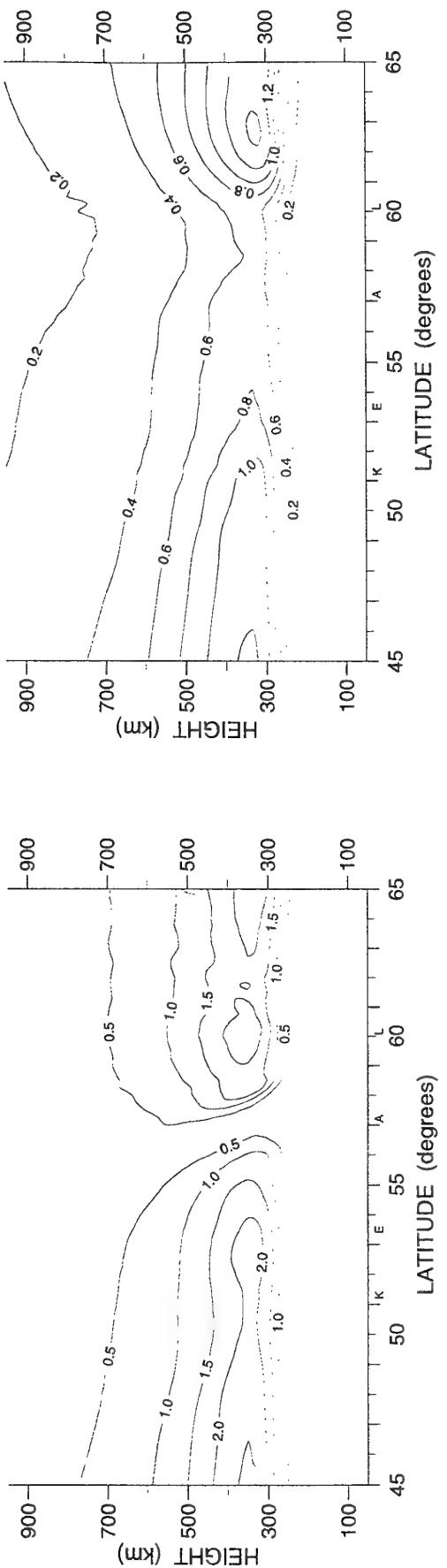
Tomographic Image: 17/03/93 21:12 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



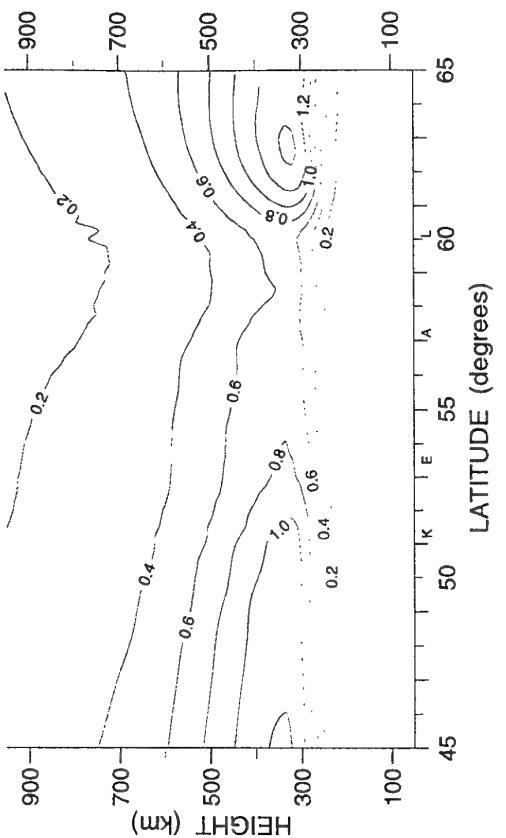
Tomographic Image: 26/03/93 20:07 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



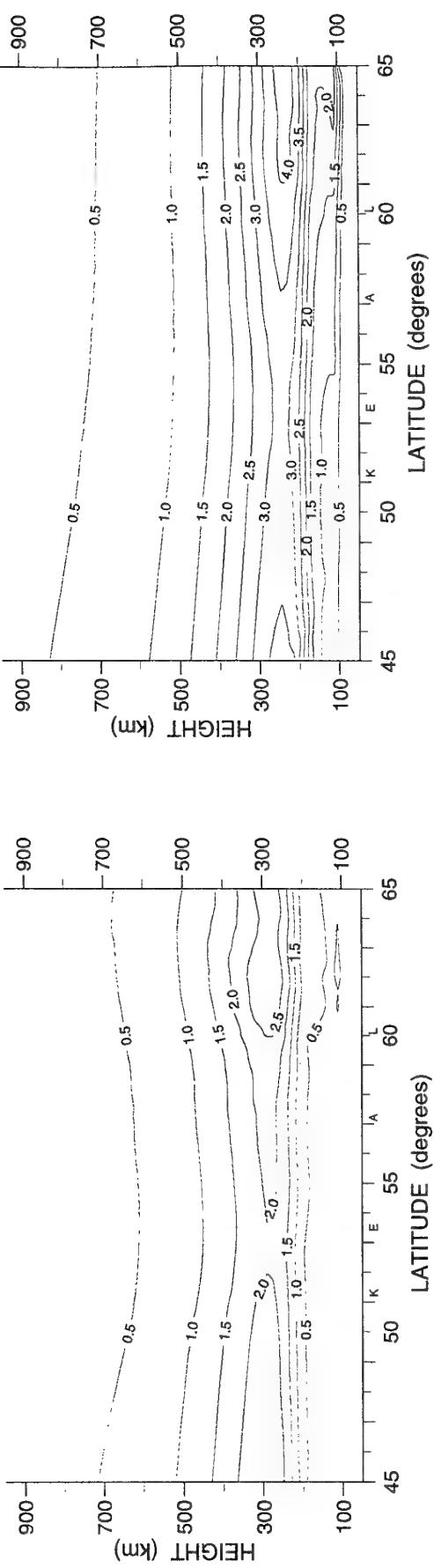
Tomographic Image: 17/03/93 22:01 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



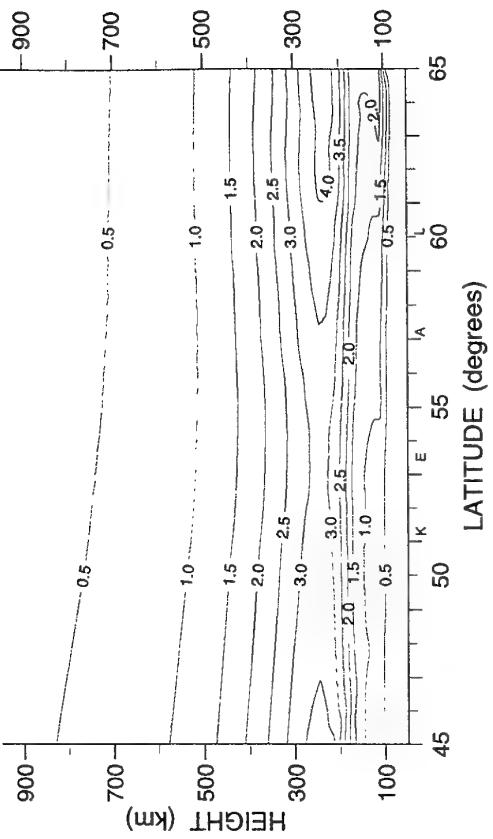
Tomographic Image: 27/03/93 04:29 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



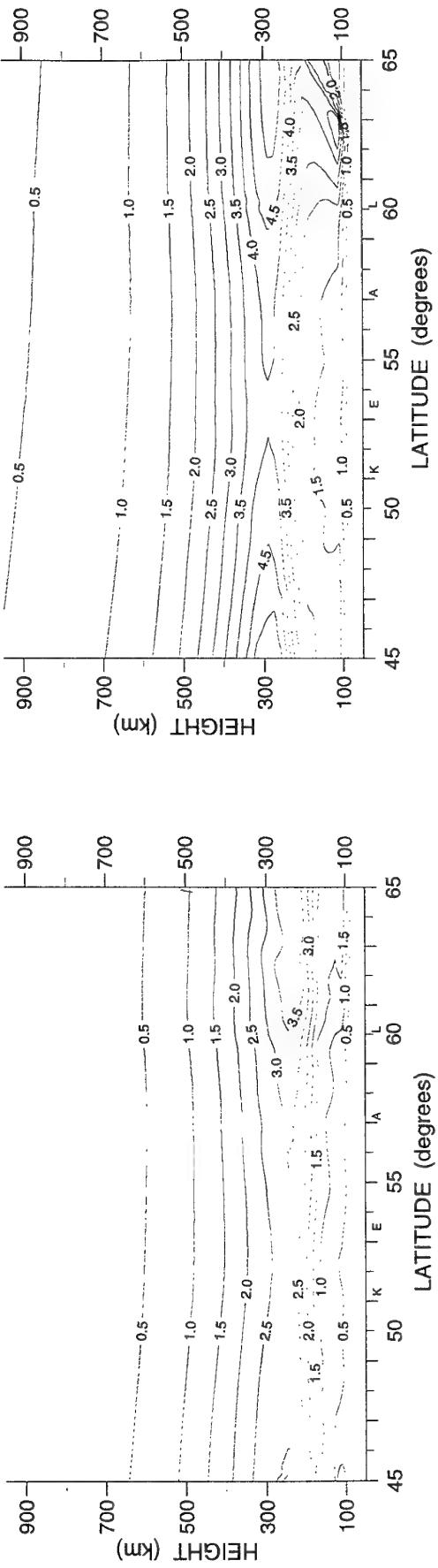
Tomographic Image: 27/03/93 05:50 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



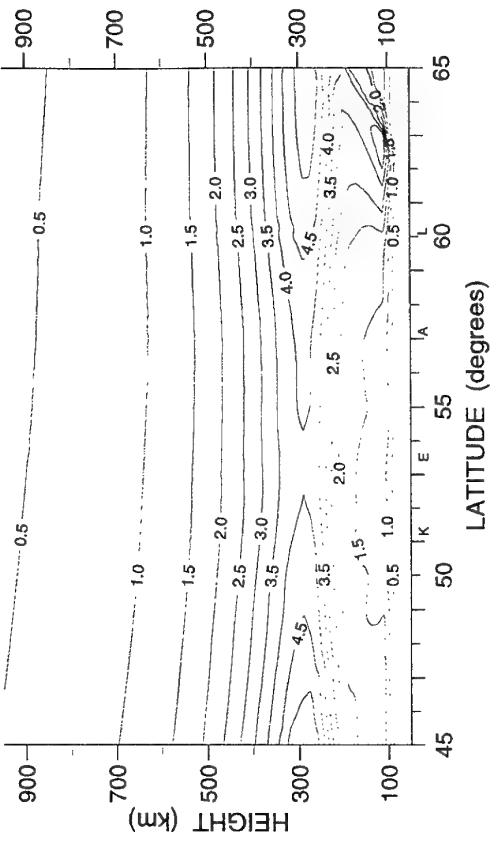
Tomographic Image: 27/03/93 07:59 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



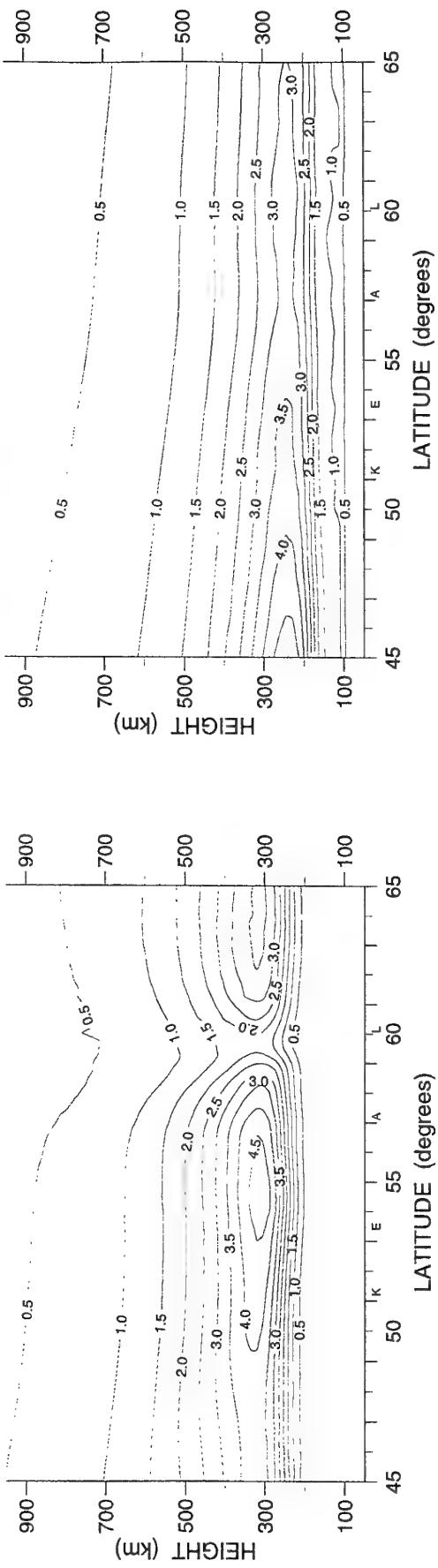
Tomographic Image: 27/03/93 07:39 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



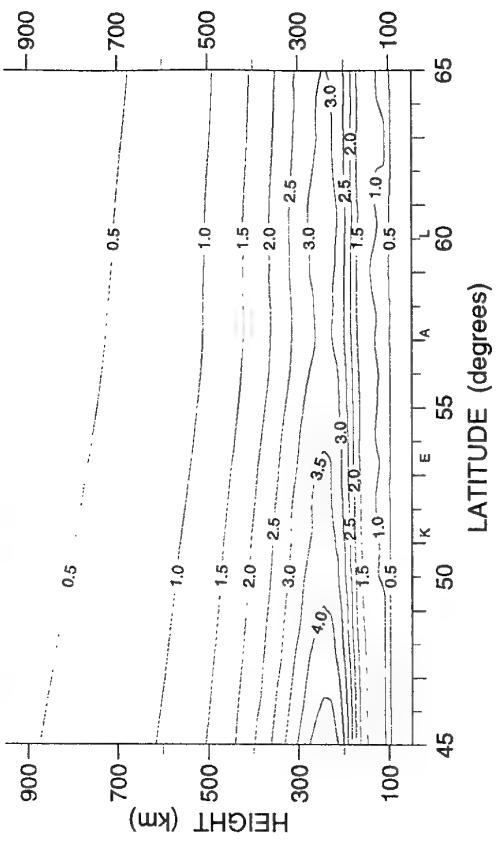
Tomographic Image: 27/03/93 11:14 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



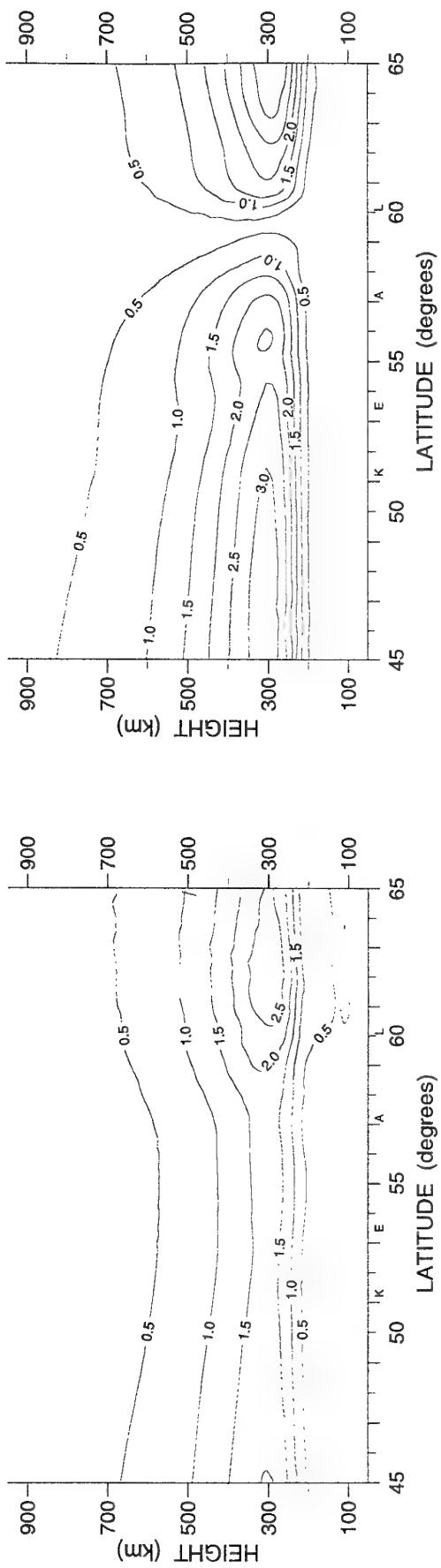
Tomographic Image: 27/03/93 20:01 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



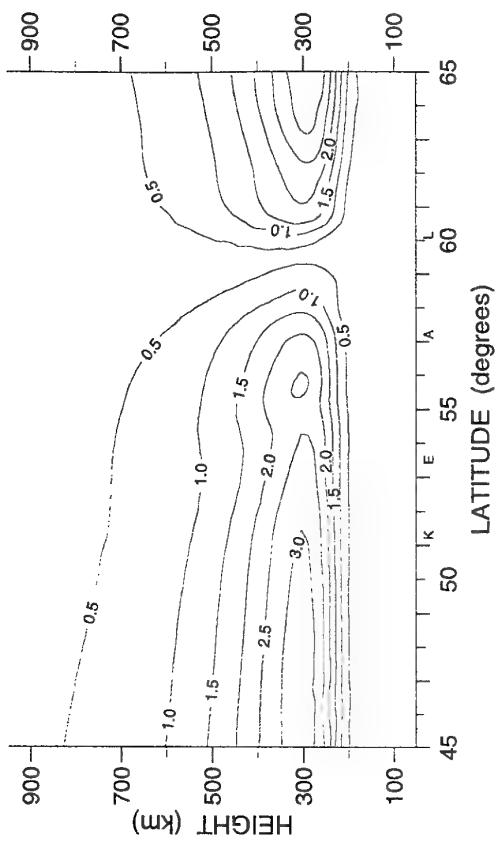
Tomographic Image: 28/03/93 08:16 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



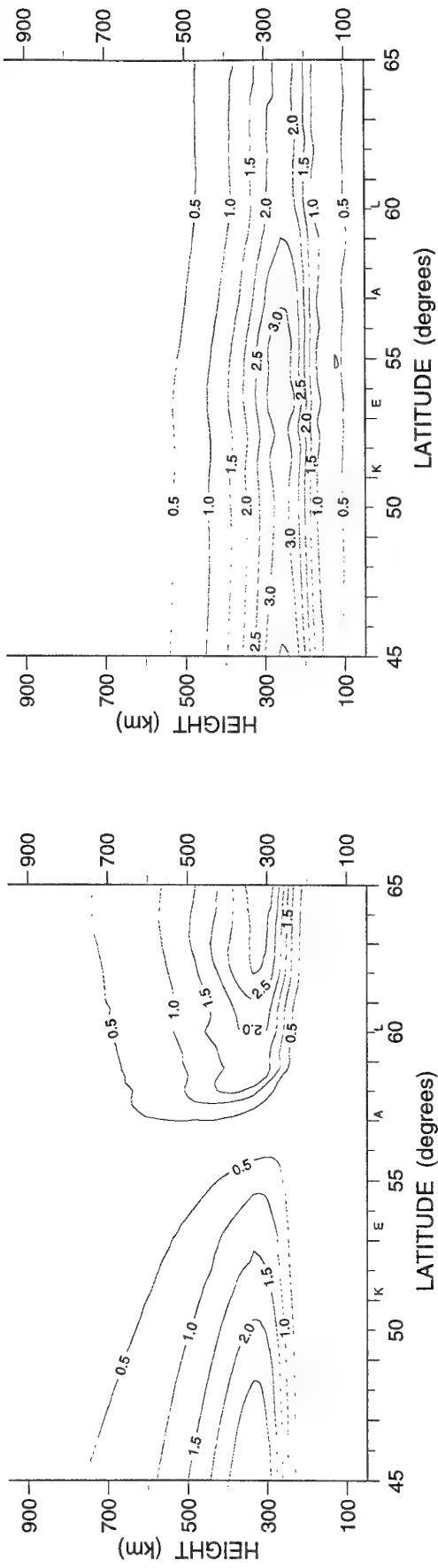
Tomographic Image: 28/03/93 05:27 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



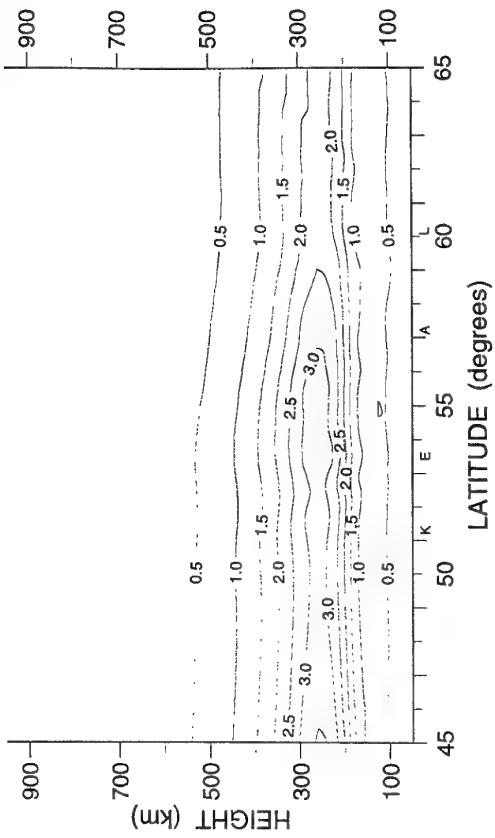
Tomographic Image: 28/03/93 19:27 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



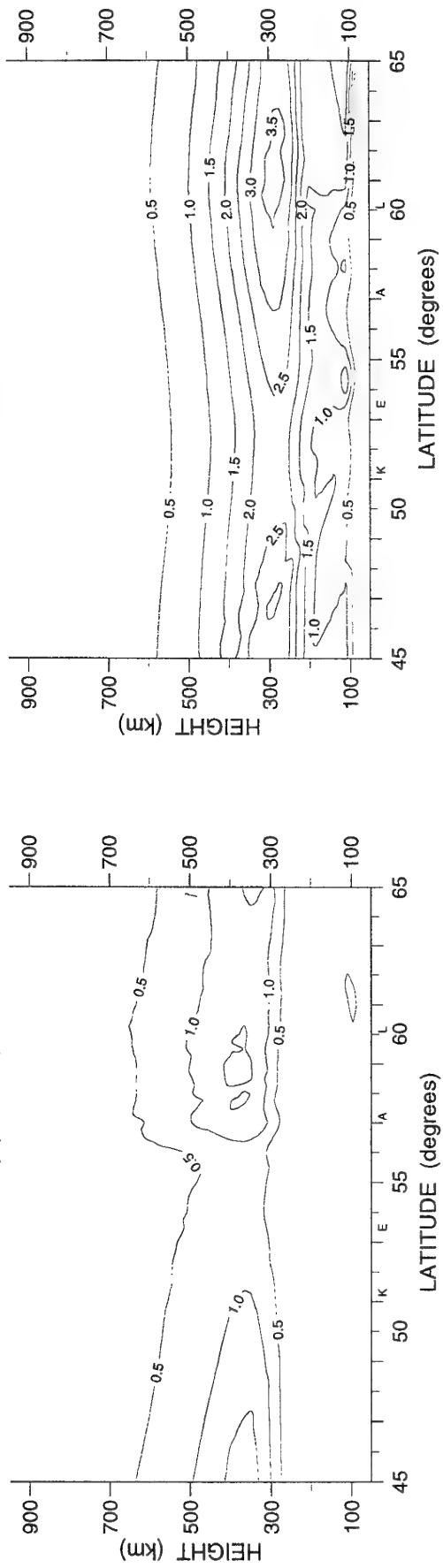
Tomographic Image: 28/03/93 21:14 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



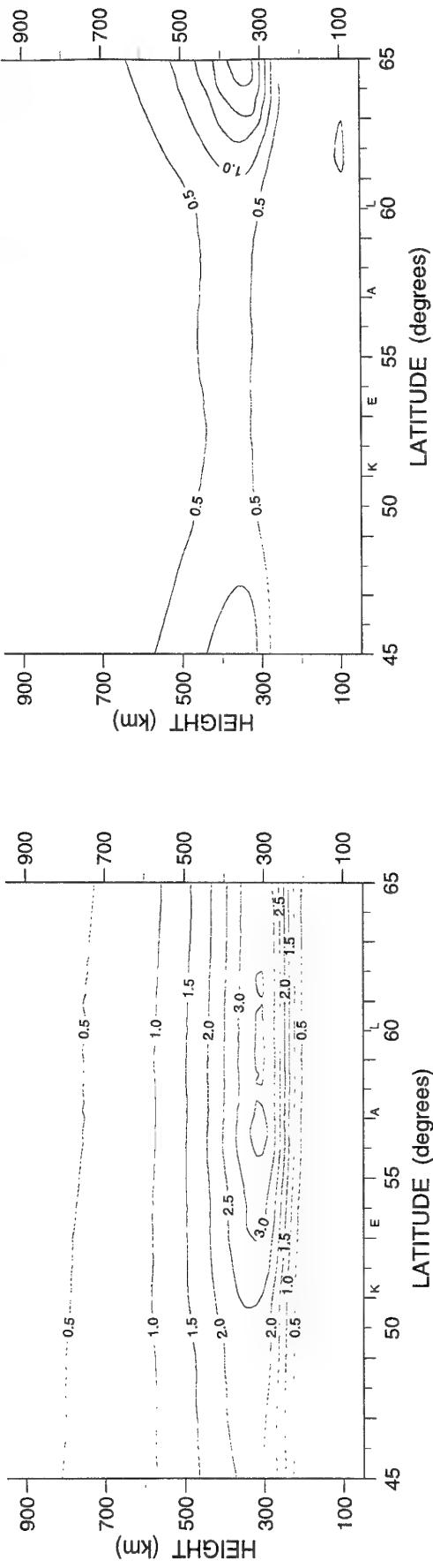
Tomographic Image: 29/03/93 06:53 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



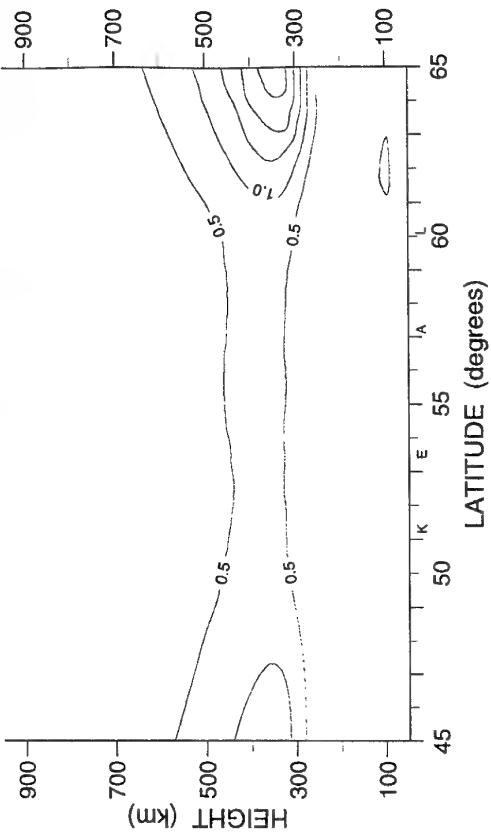
Tomographic Image: 29/03/93 03:14 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



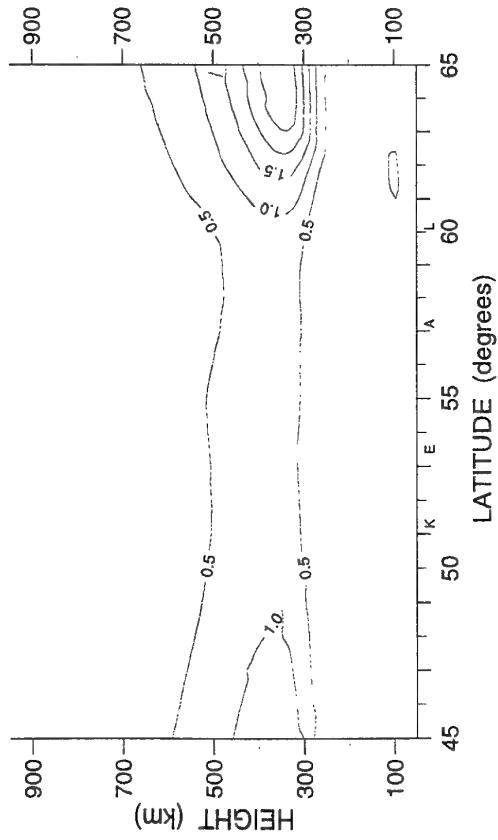
Tomographic Image: 29/03/93 20:31 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

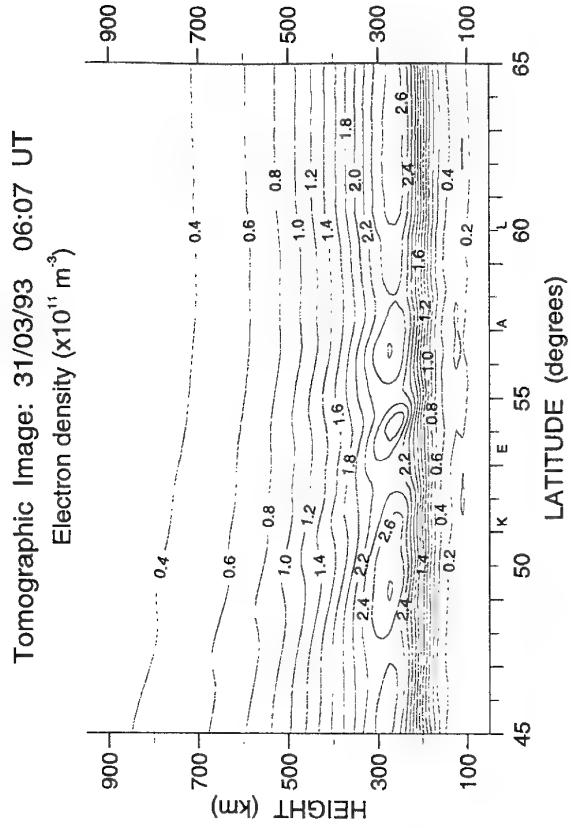
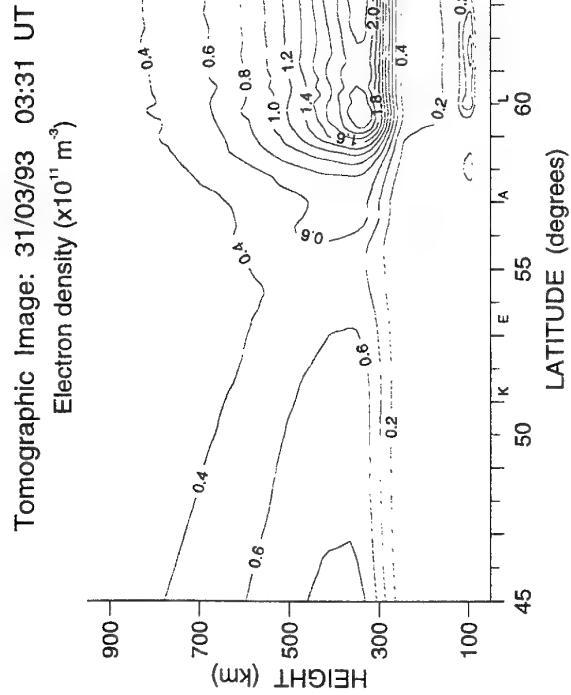
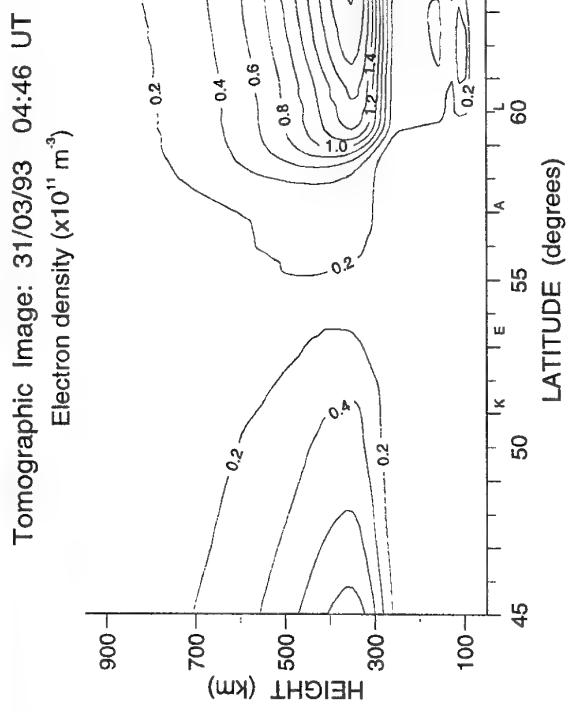
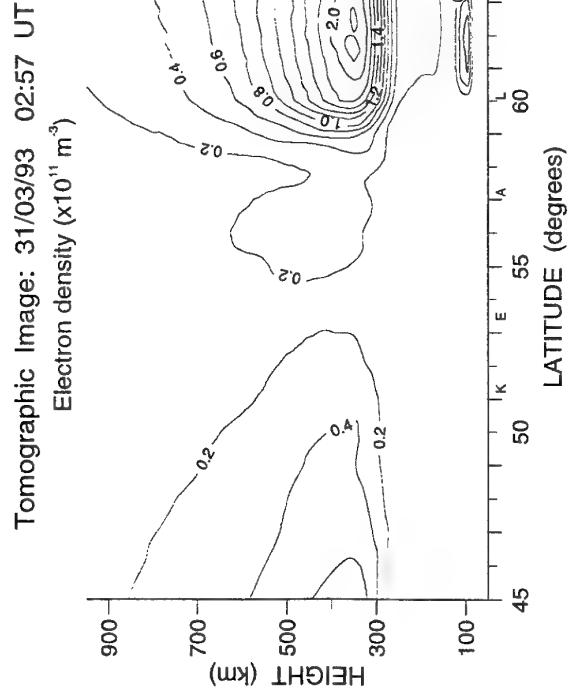


Tomographic Image: 30/03/93 03:20 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

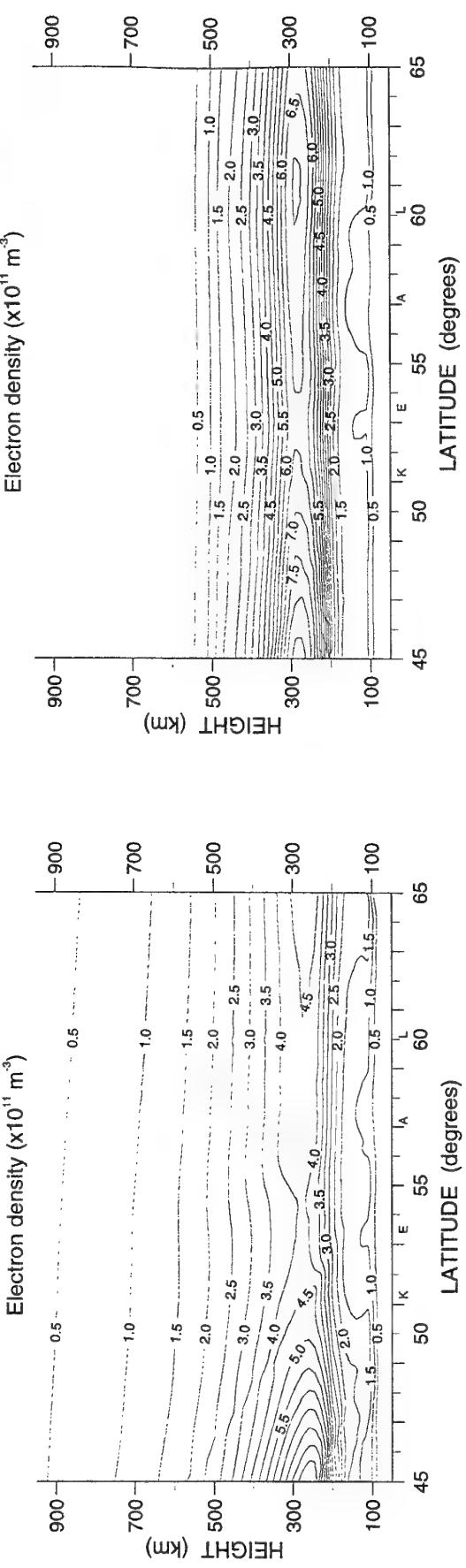


Tomographic Image: 30/03/93 02:29 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

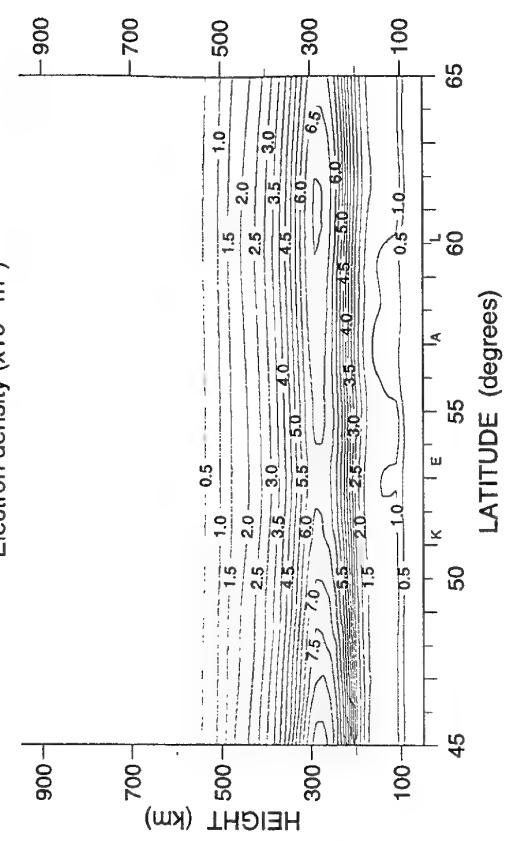




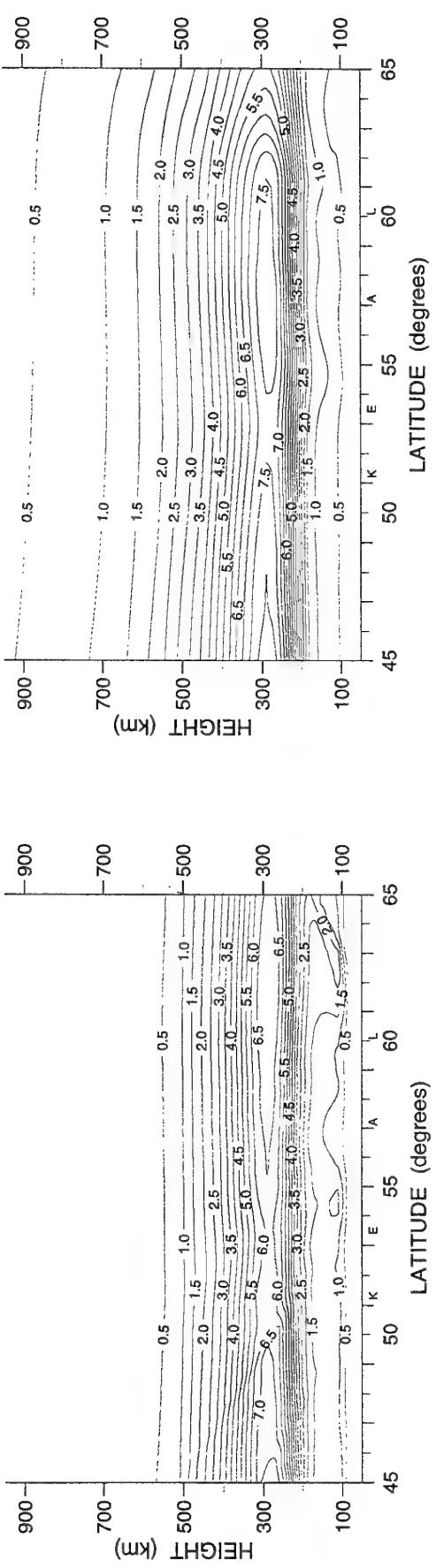
Tomographic Image: 31/03/93 11:12 UT



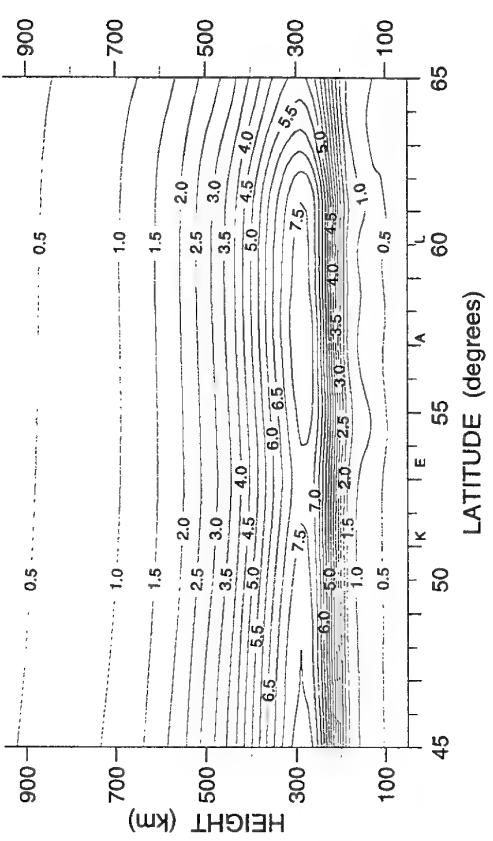
Tomographic Image: 31/03/93 15:18 UT

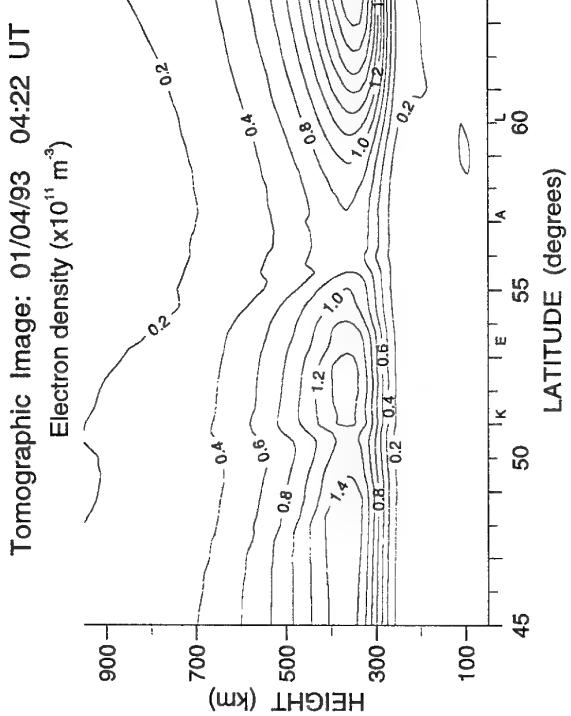
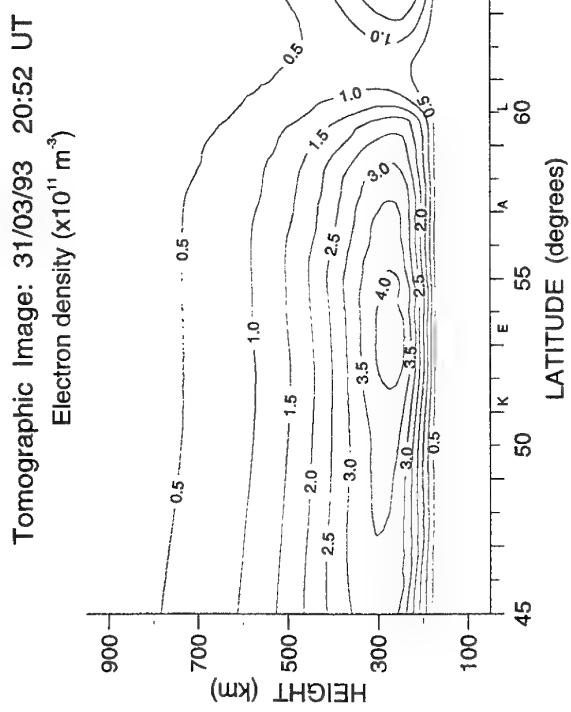
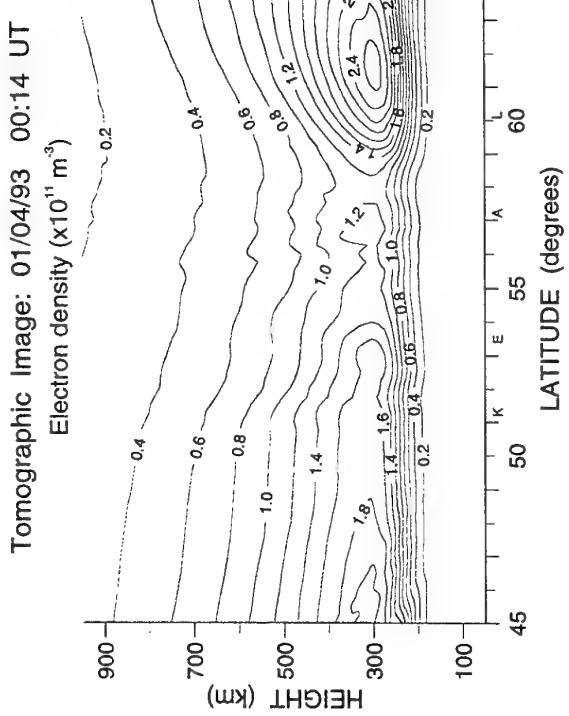
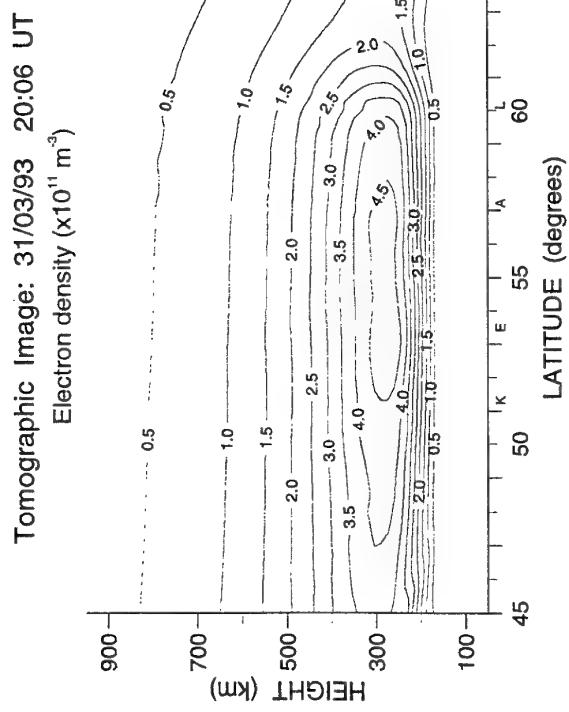


Tomographic Image: 31/03/93 13:54 UT

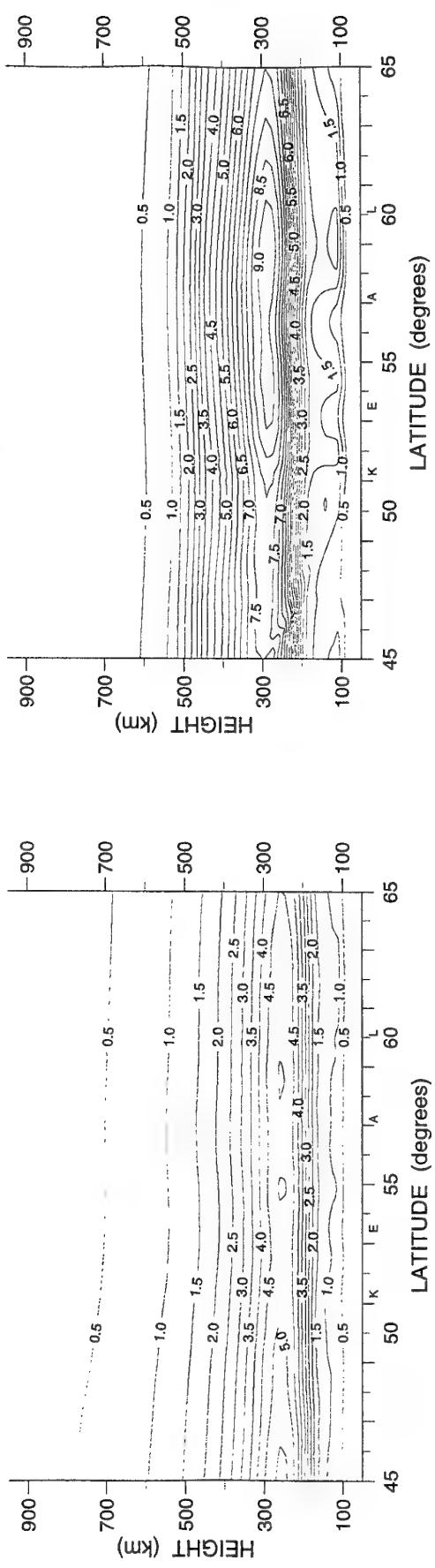


Tomographic Image: 31/03/93 17:07 UT

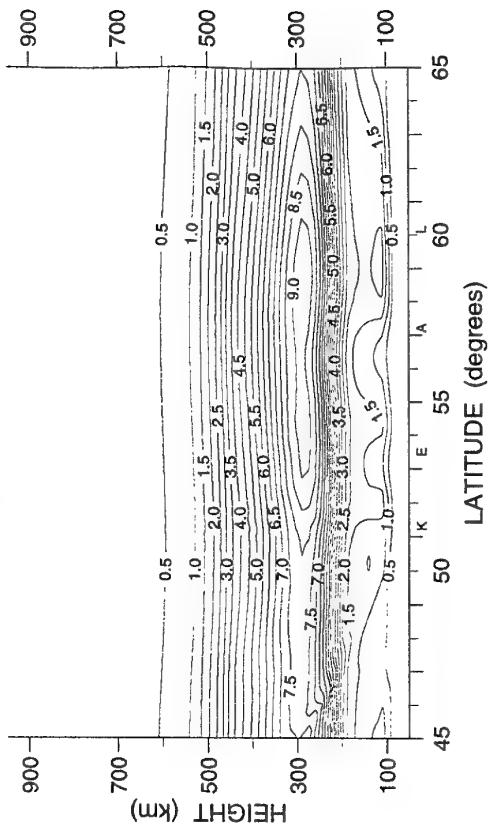




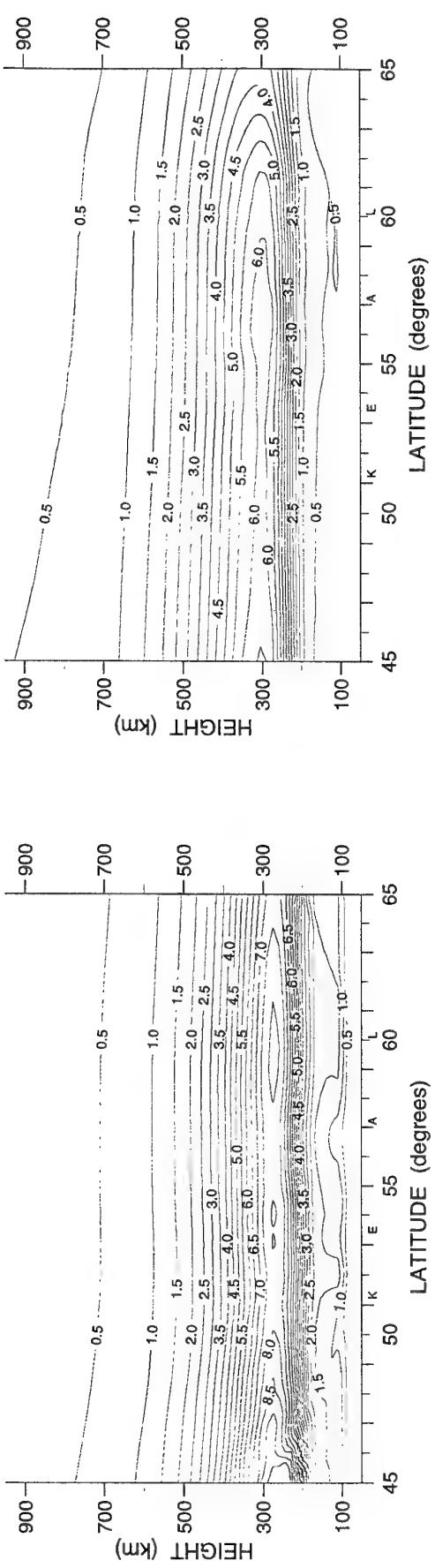
Tomographic Image: 01/04/93 07:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



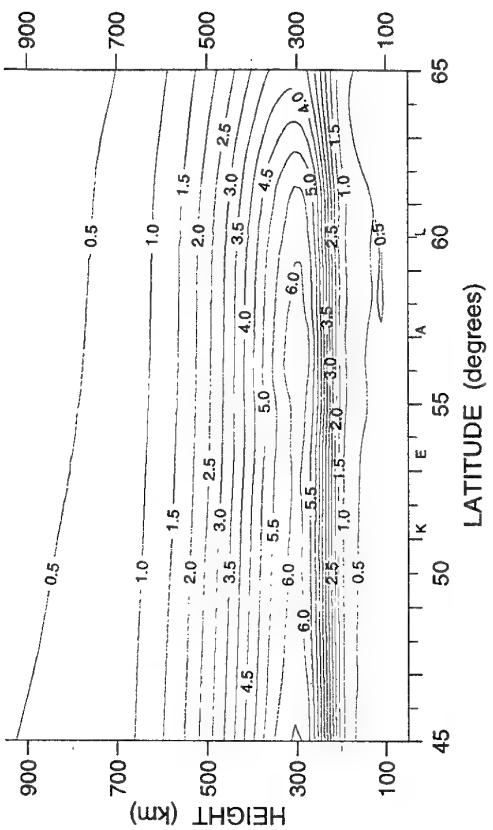
Tomographic Image: 01/04/93 14:55 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



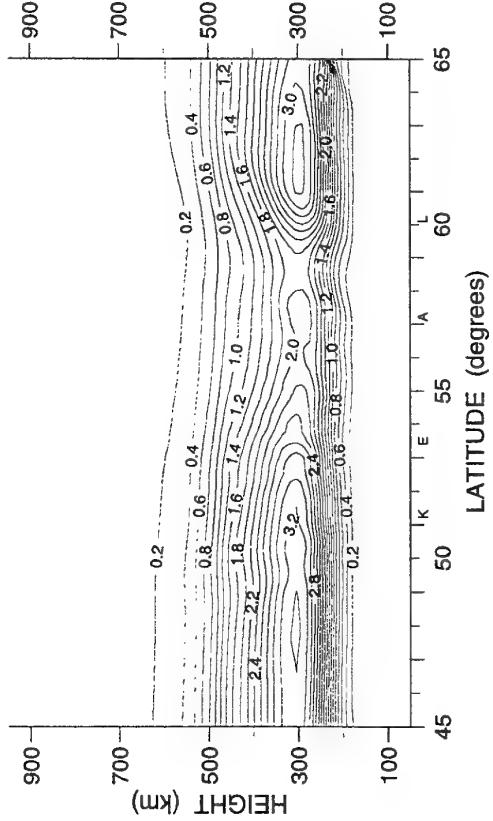
Tomographic Image: 01/04/93 12:33 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

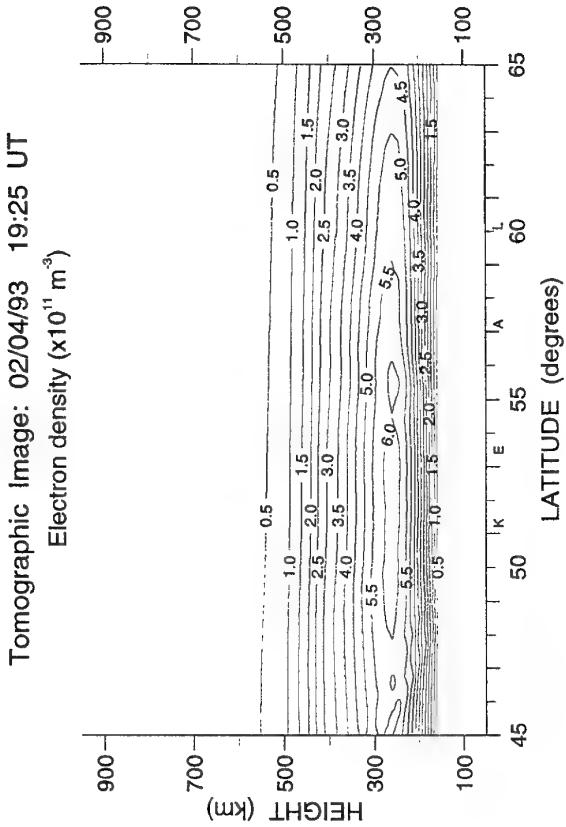
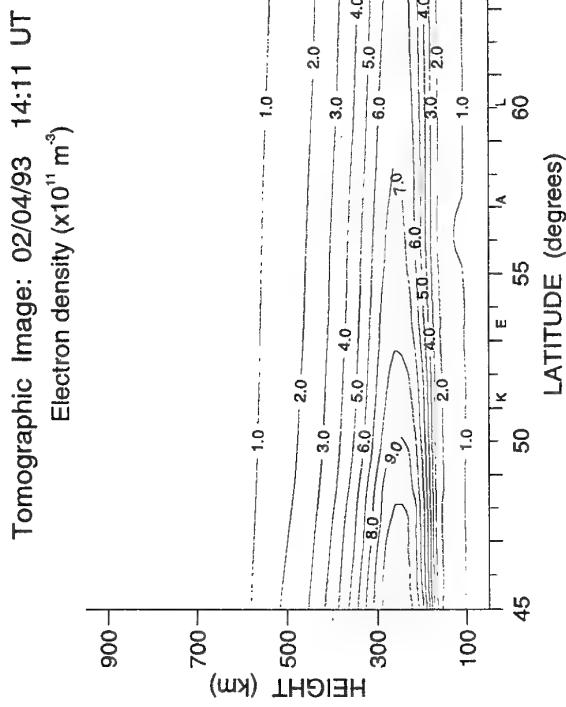
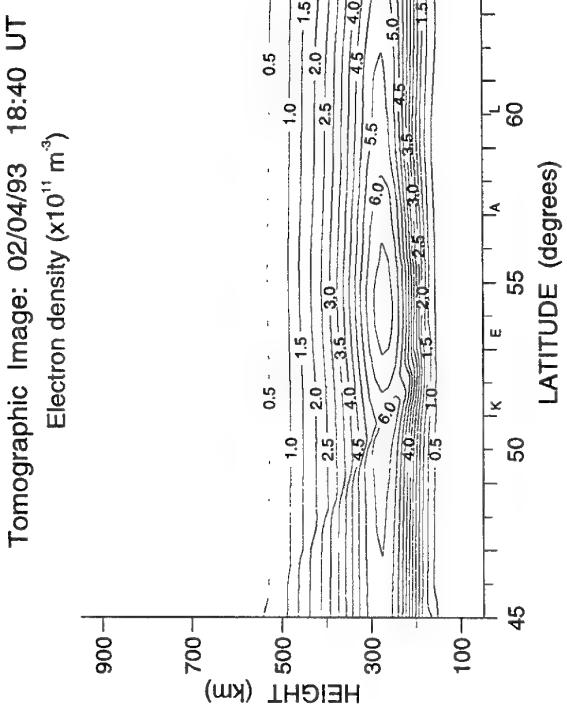
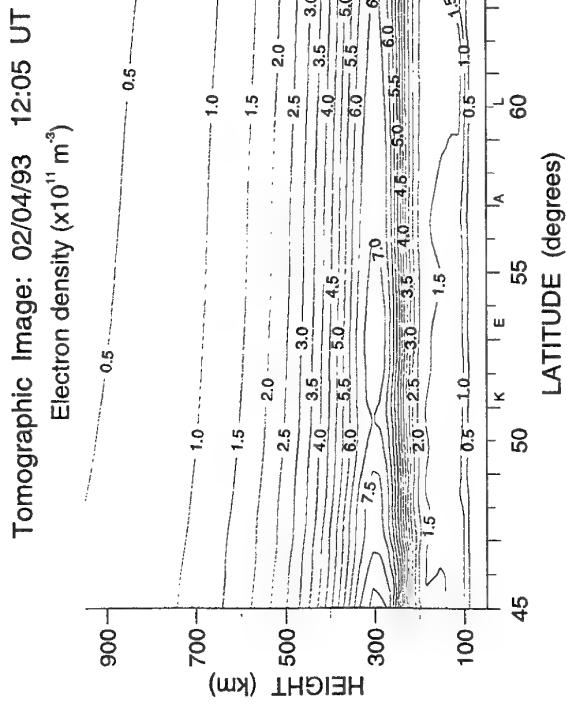


Tomographic Image: 01/04/93 18:06 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

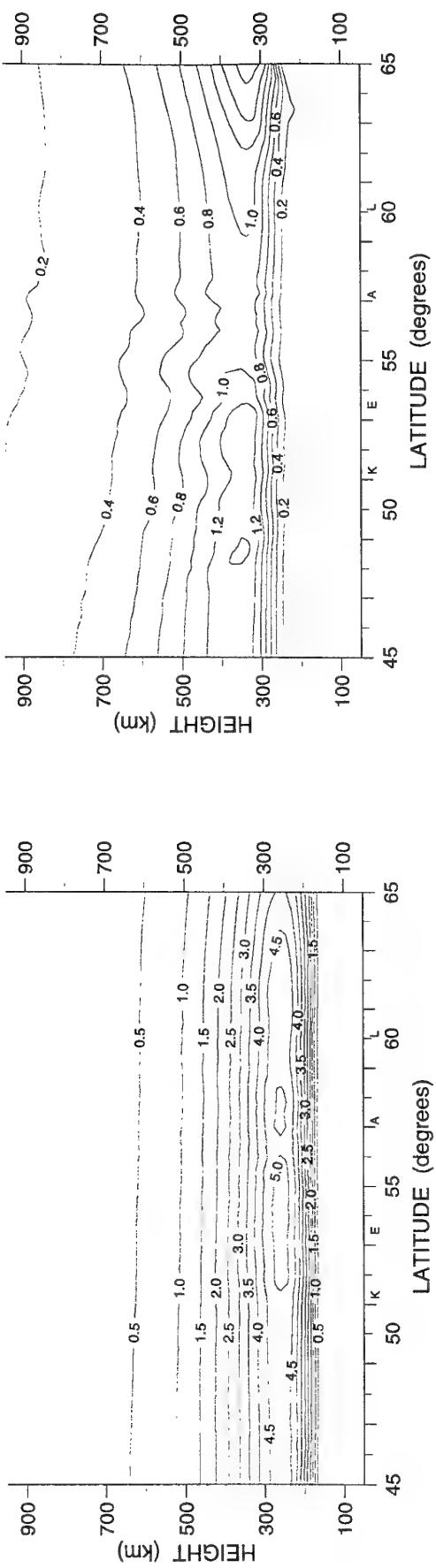


Tomographic Image: 01/04/93 23:46 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

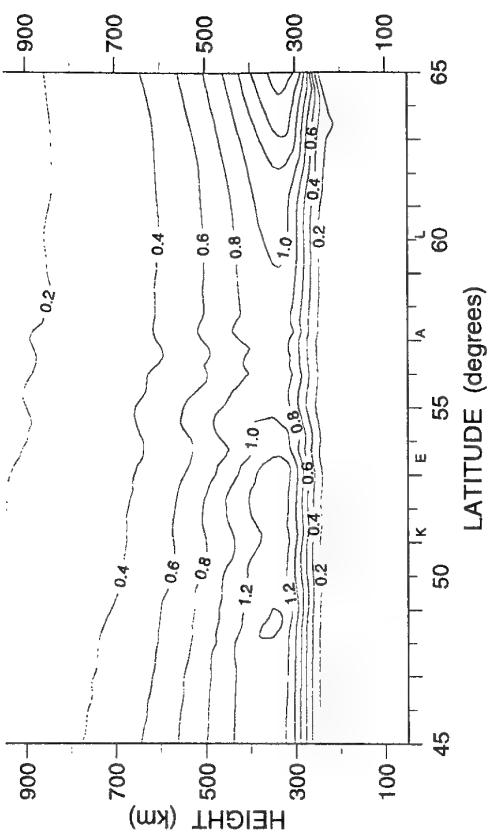




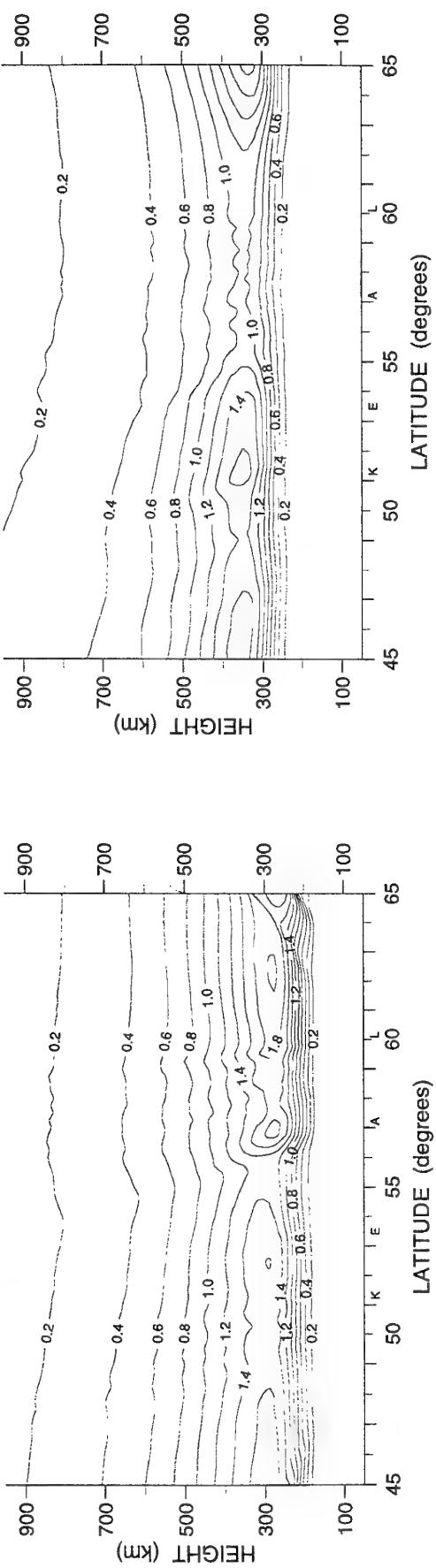
Tomographic Image: 02/04/93 20:27 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



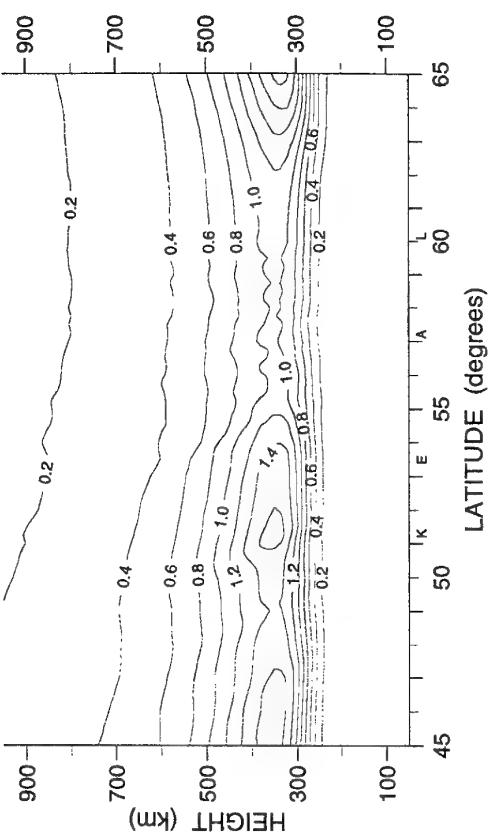
Tomographic Image: 03/04/93 03:03 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

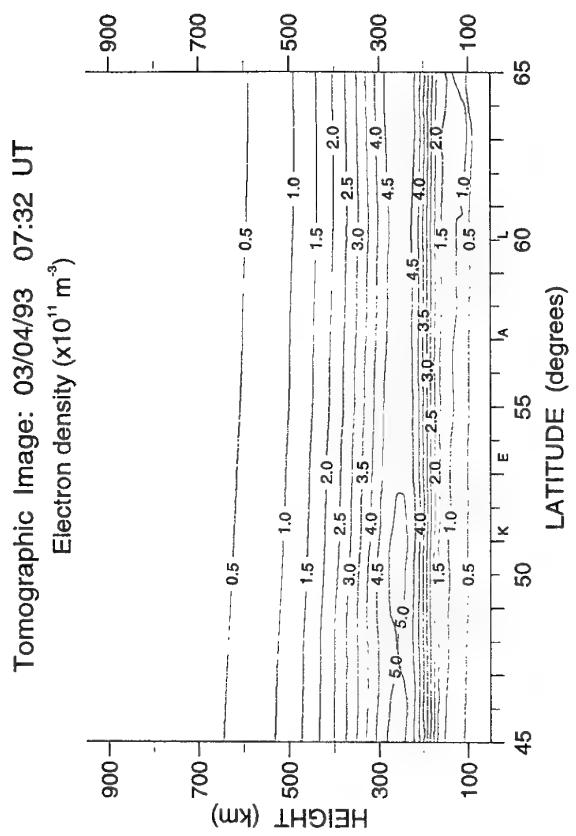
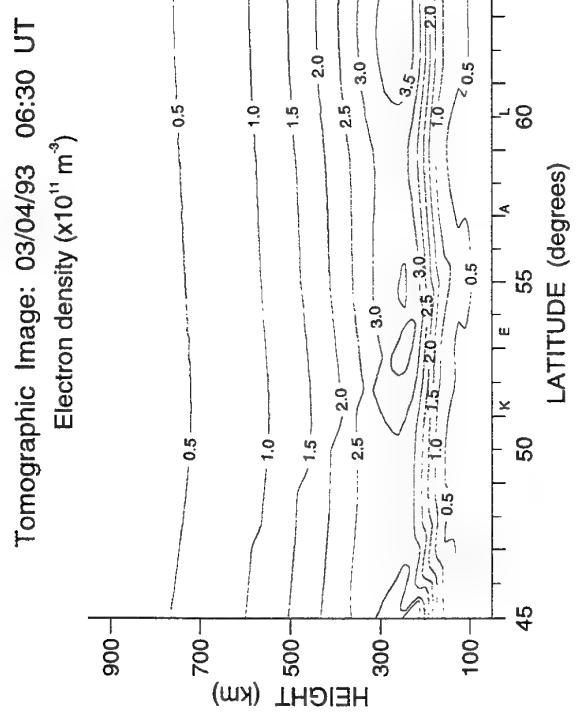
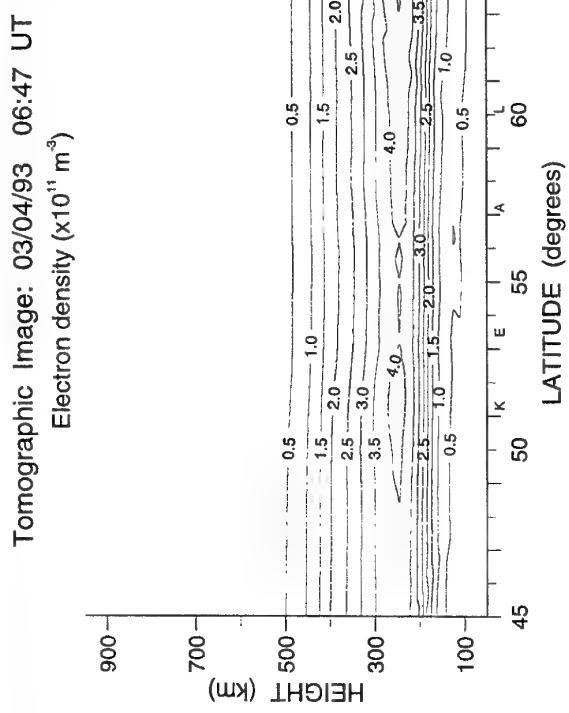
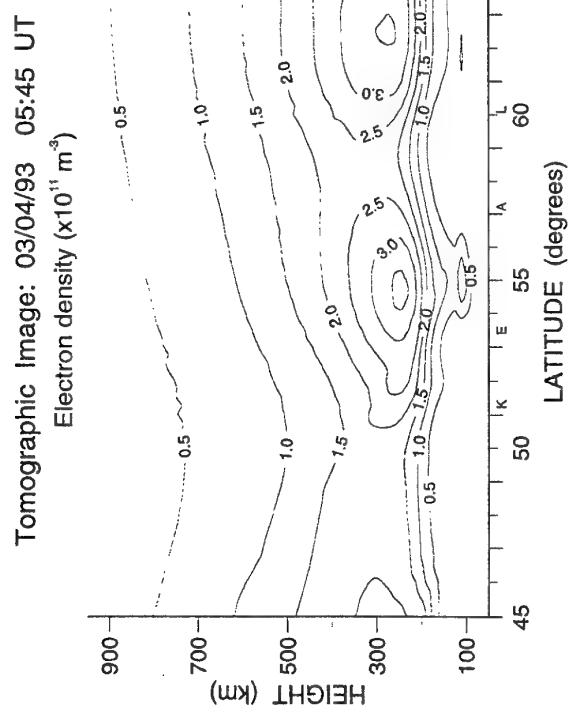


Tomographic Image: 02/04/93 23:18 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

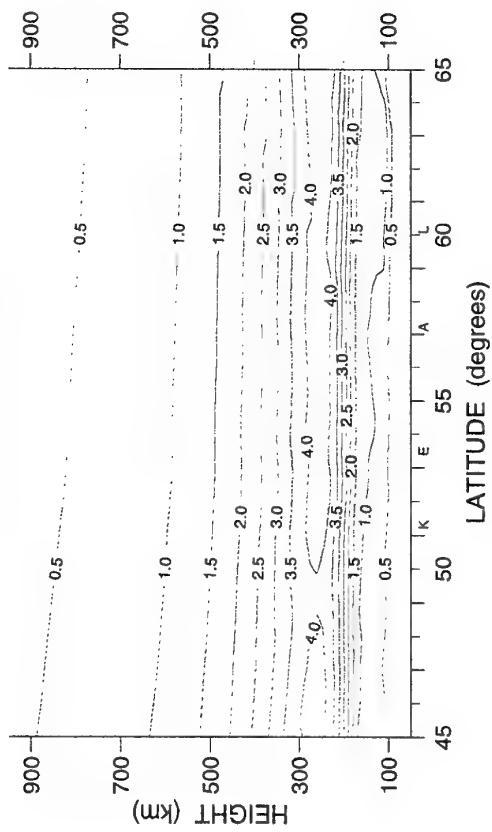


Tomographic Image: 03/04/93 03:36 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

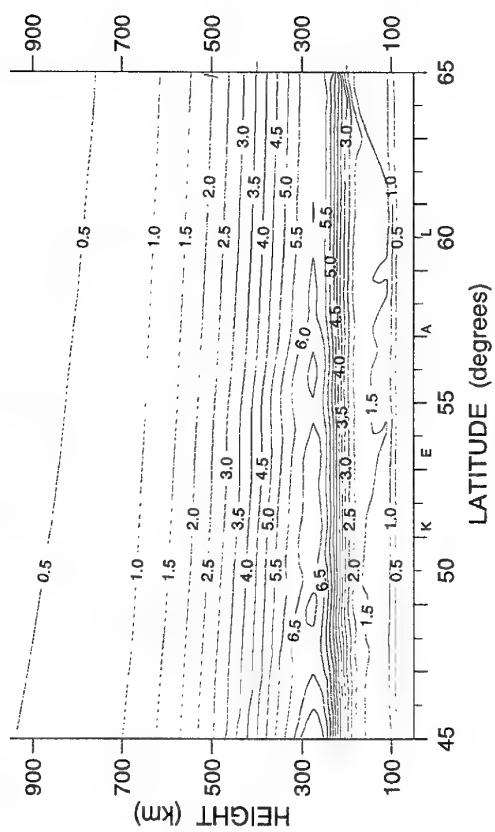




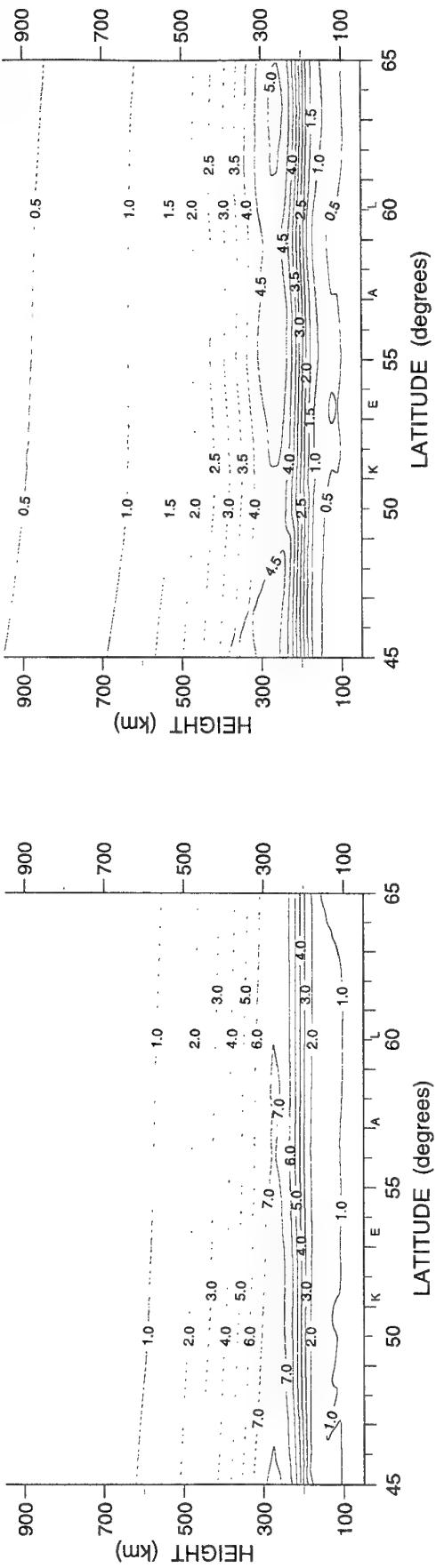
Tomographic Image: 03/04/93 08:18 UT  
 Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



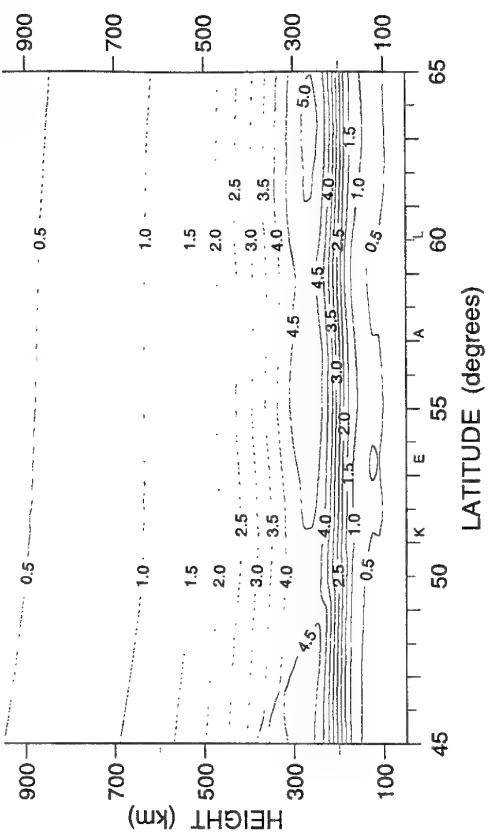
Tomographic Image: 03/04/93 11:37 UT  
 Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



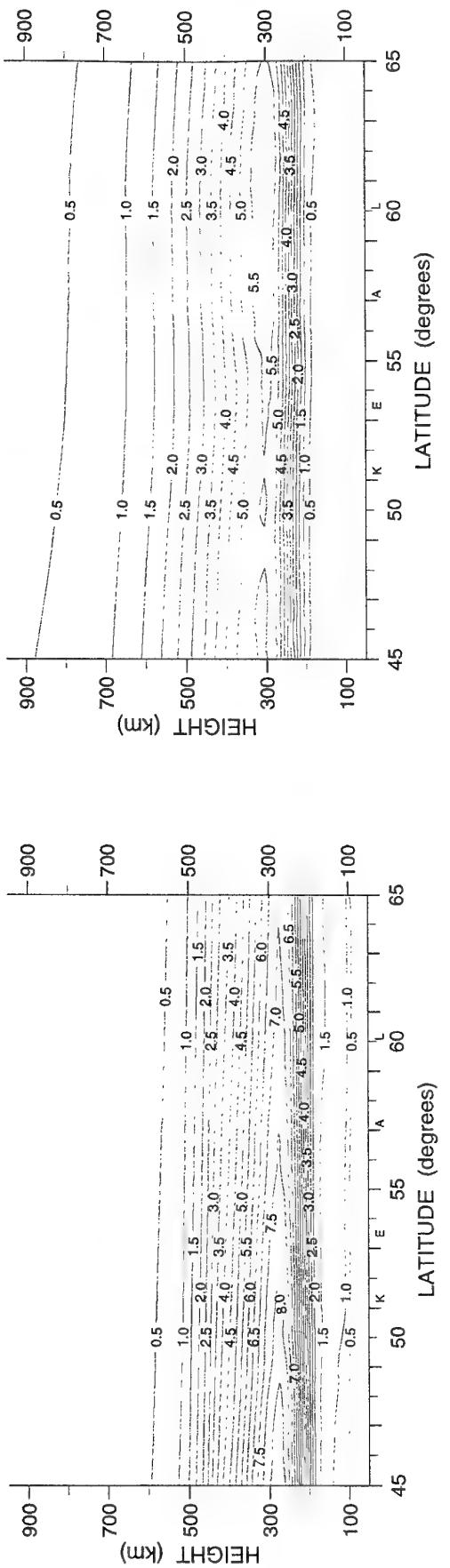
**Tomographic Image: 03/04/93 15:13 UT**  
 Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



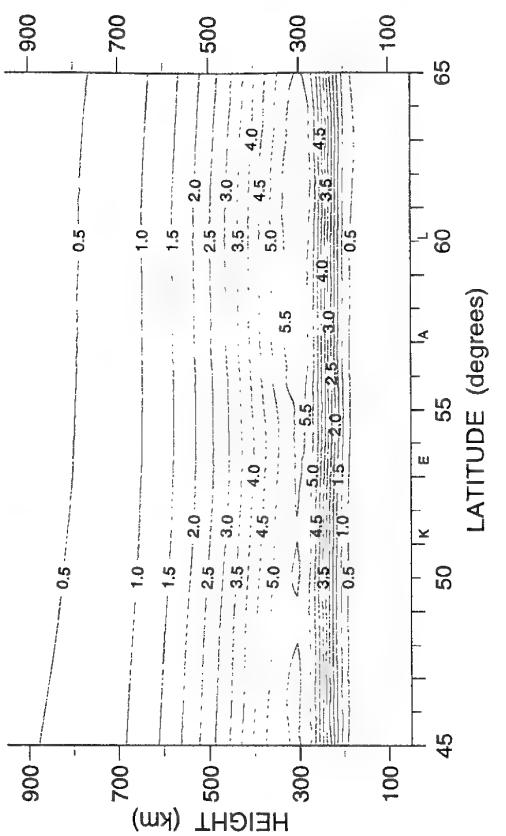
**Tomographic Image: 03/04/93 17:20 UT**  
 Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



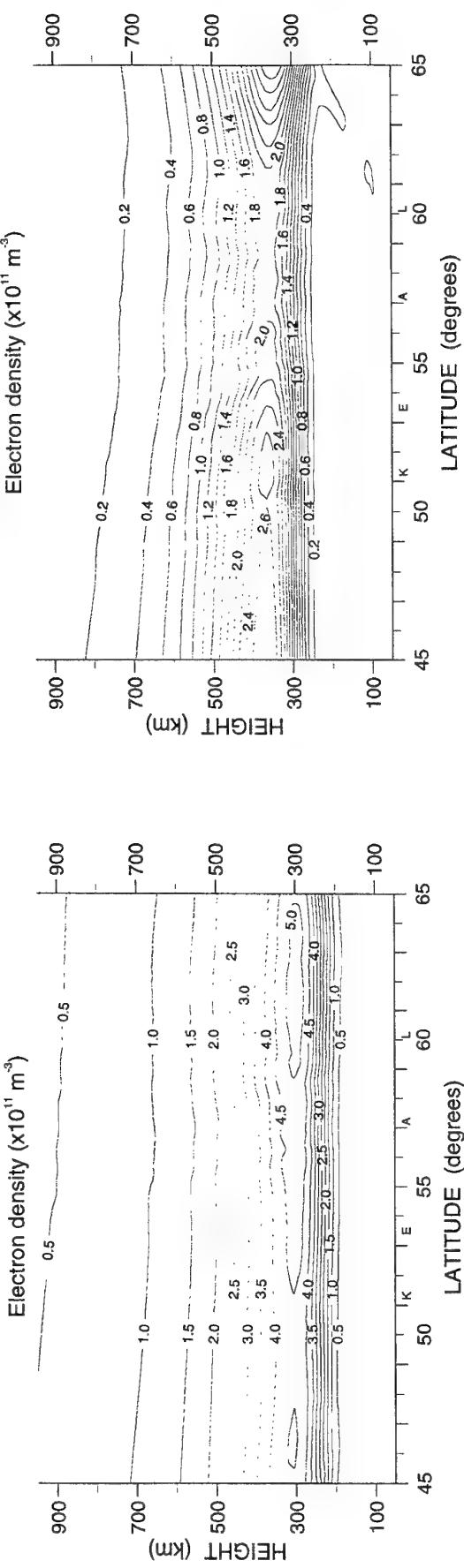
**Tomographic Image: 03/04/93 15:58 UT**  
 Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



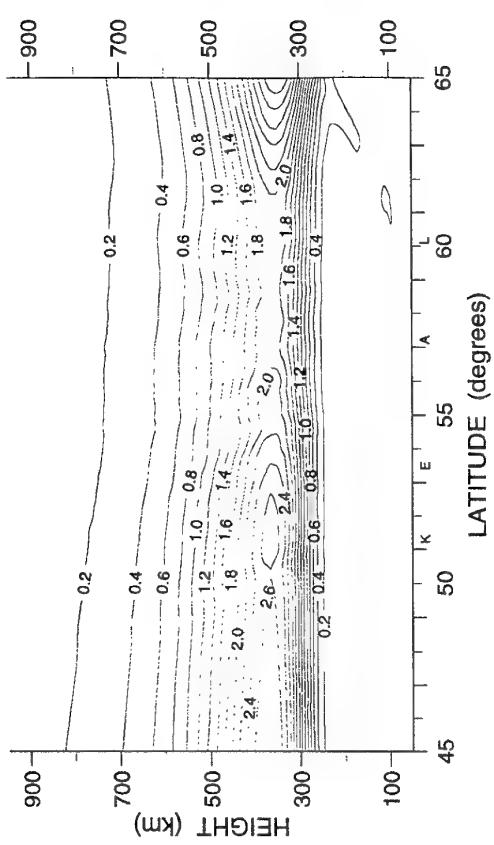
**Tomographic Image: 03/04/93 19:09 UT**  
 Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



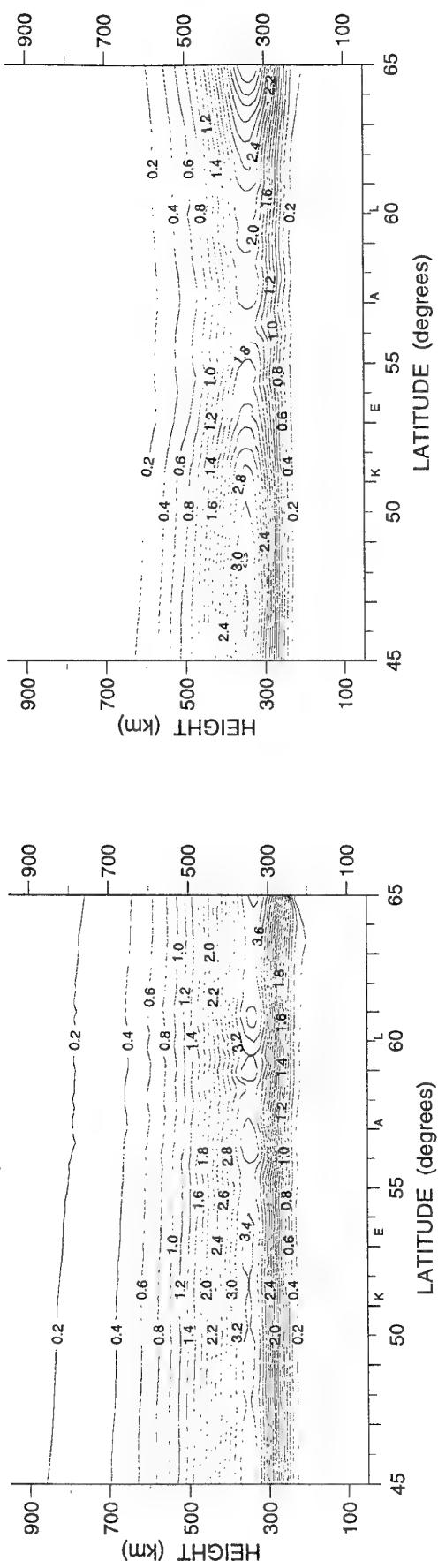
Tomographic Image: 03/04/93 19:44 UT



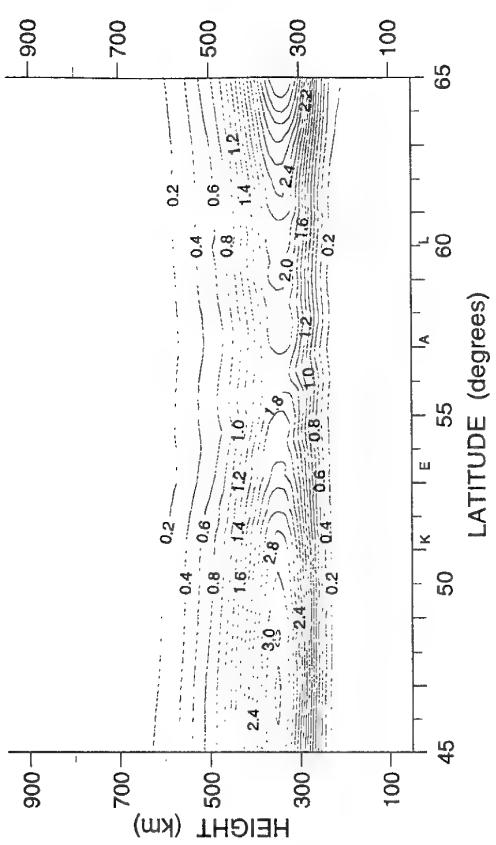
Tomographic Image: 04/04/93 02:18 UT

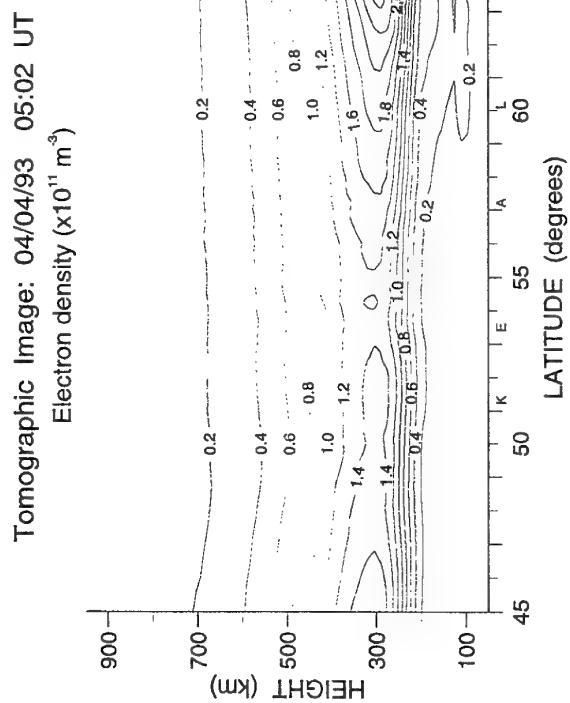


Tomographic Image: 03/04/93 22:50 UT

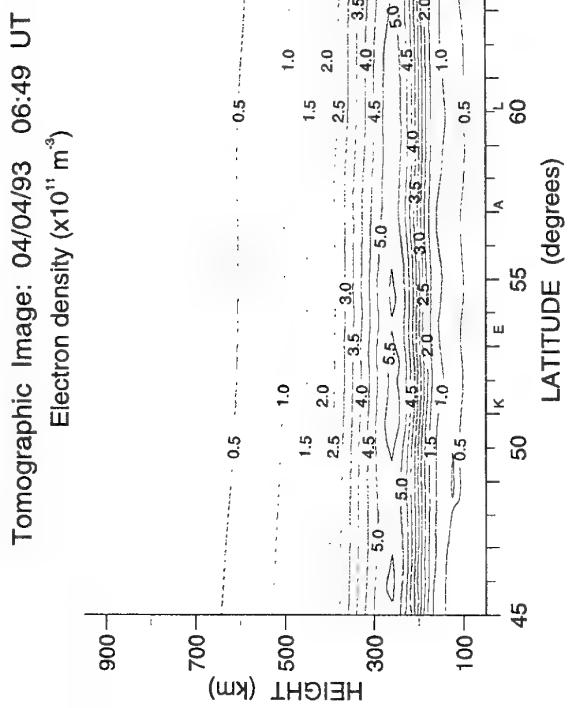


Tomographic Image: 04/04/93 03:13 UT

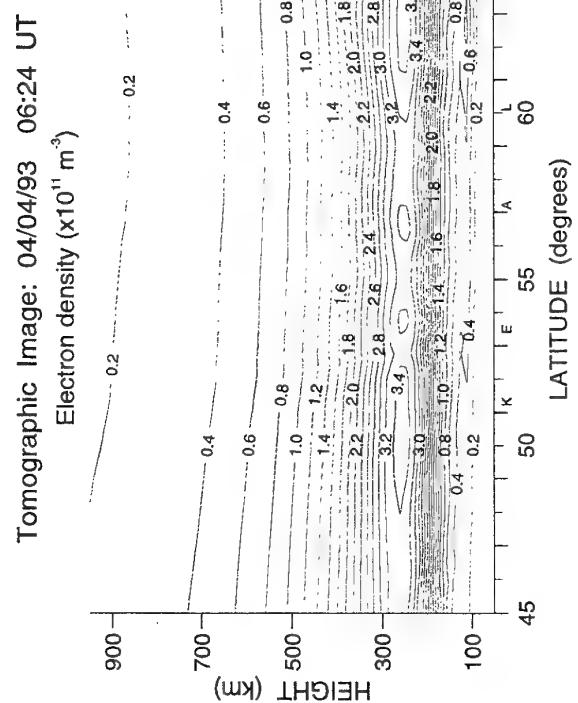




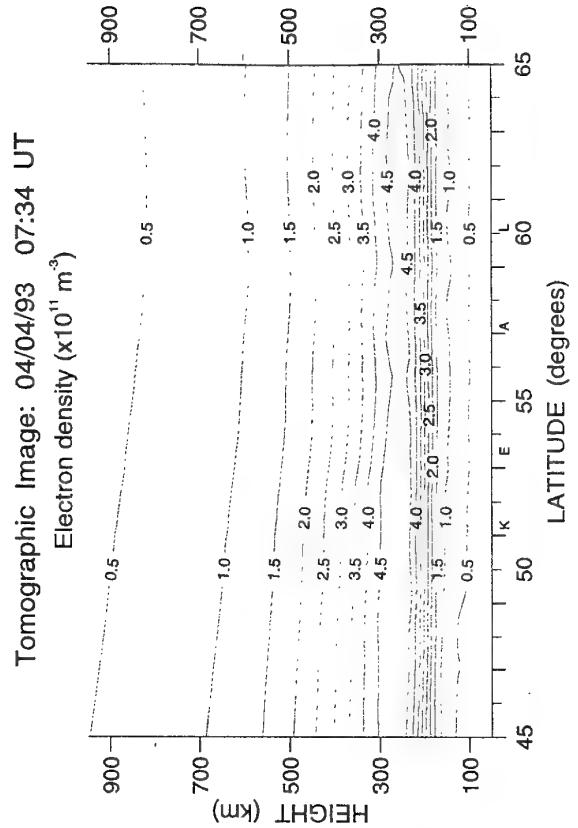
Tomographic Image: 04/04/93 05:02 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



Tomographic Image: 04/04/93 06:49 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

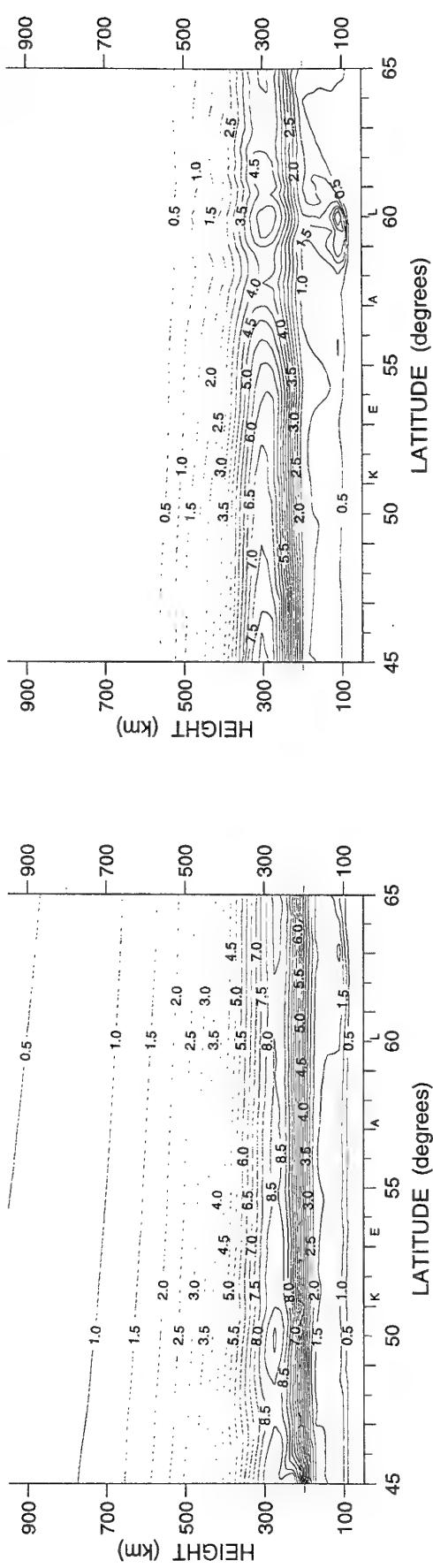


Tomographic Image: 04/04/93 06:24 UT  
Electron density ( $\times 10^{19} \text{ m}^{-3}$ )

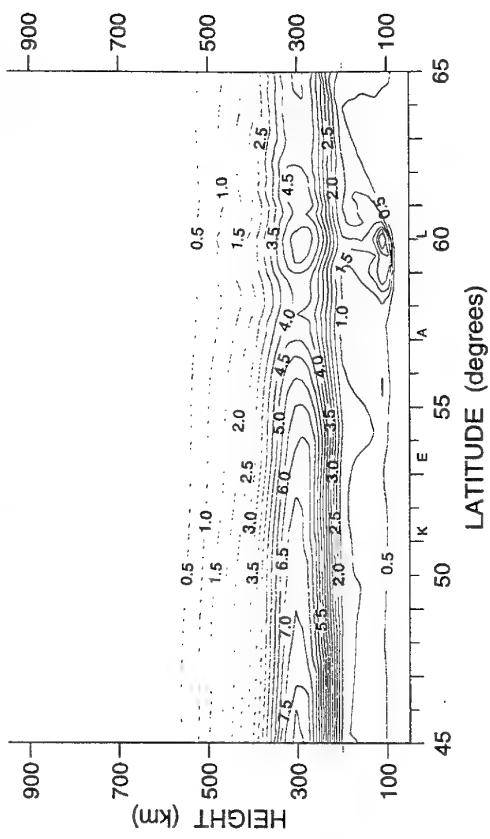


Tomographic Image: 04/04/93 07:34 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

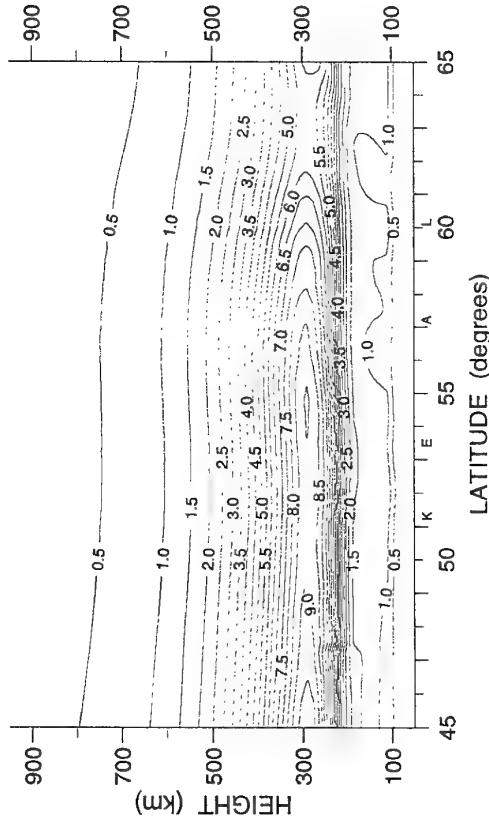
Tomographic Image: 04/04/93 11:09 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



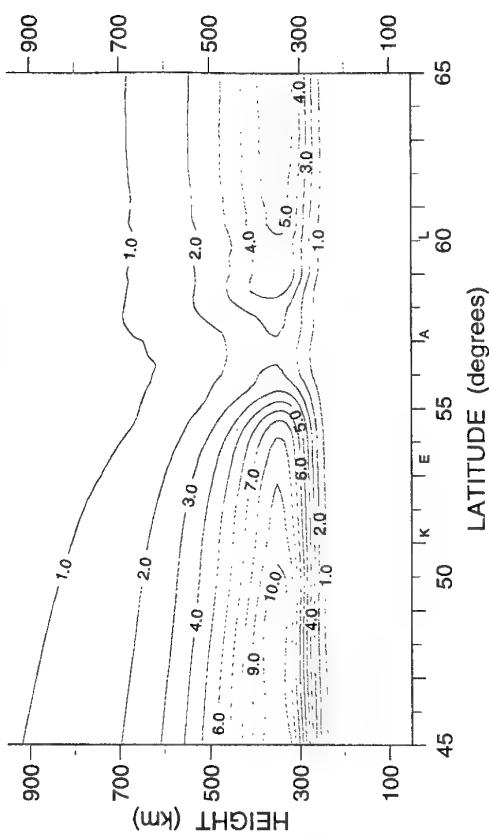
Tomographic Image: 04/04/93 16:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

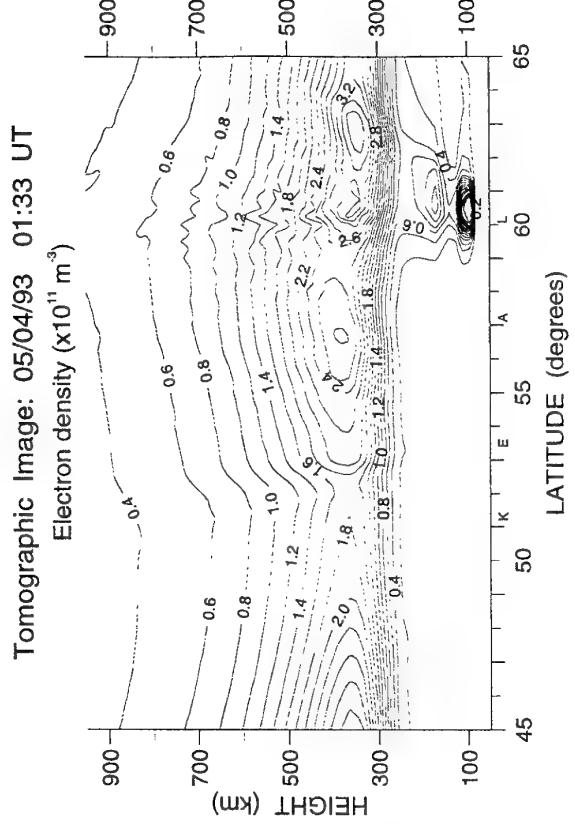
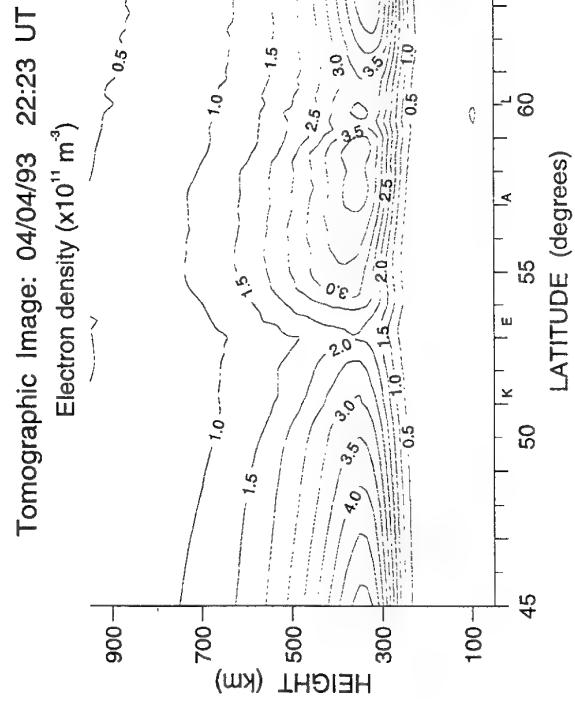
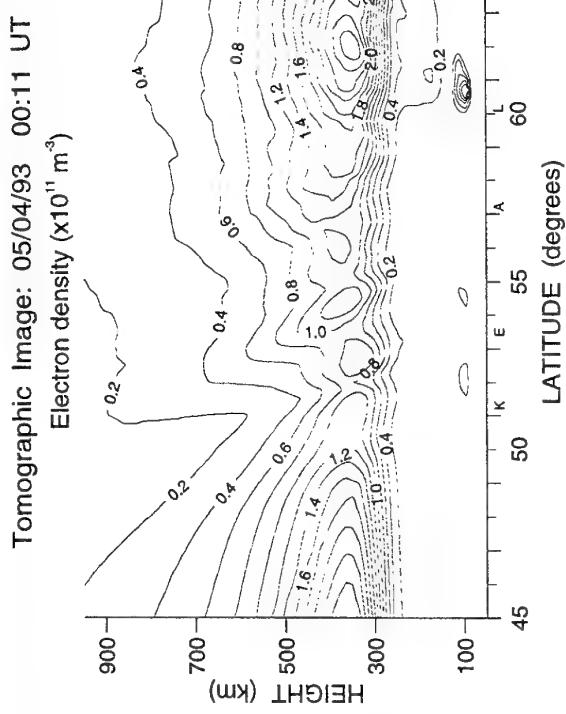
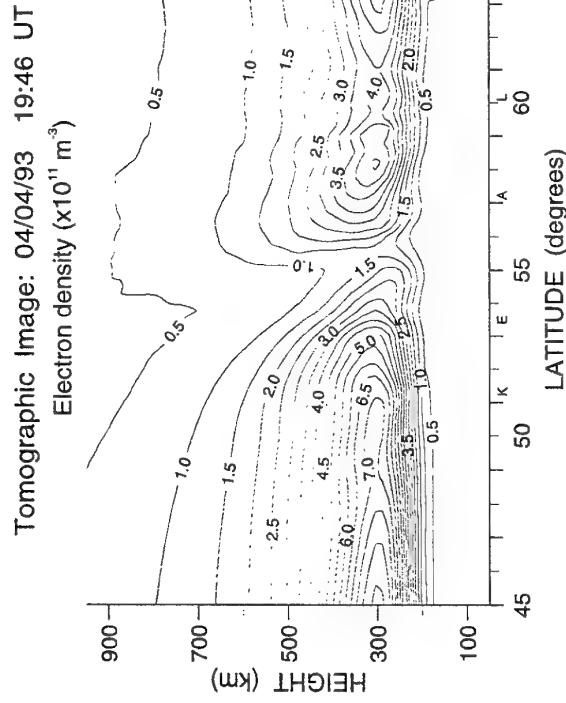


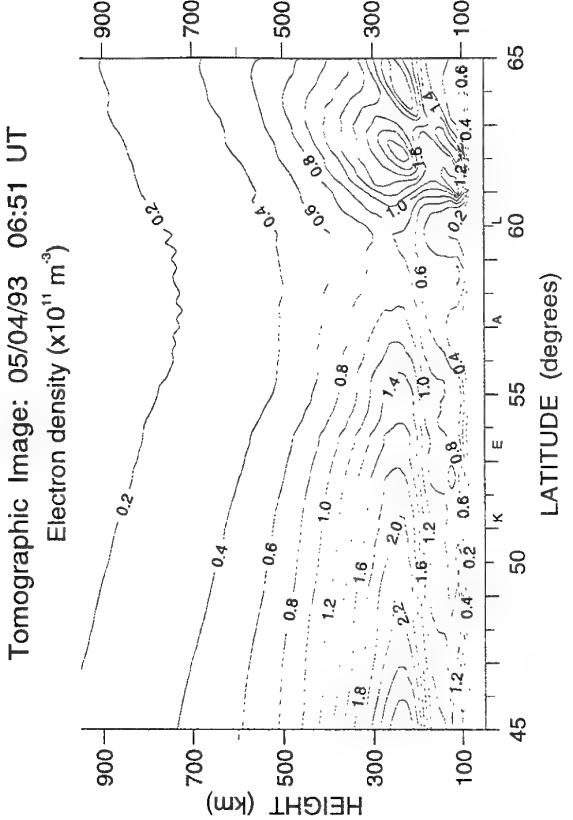
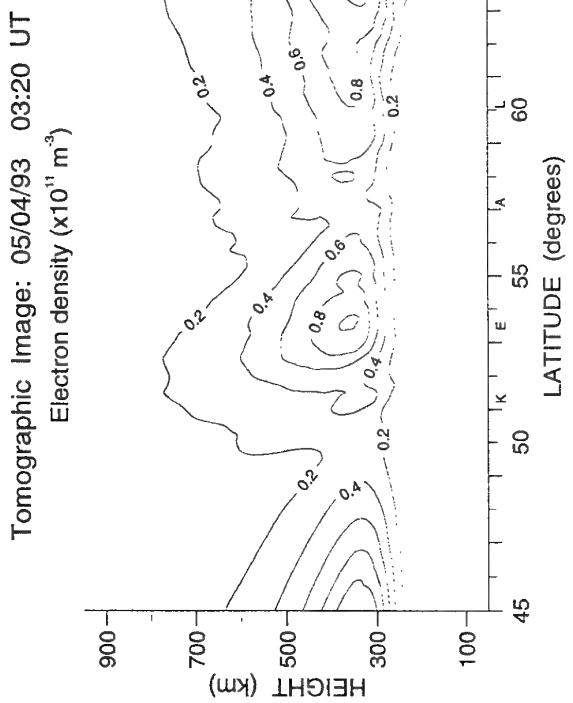
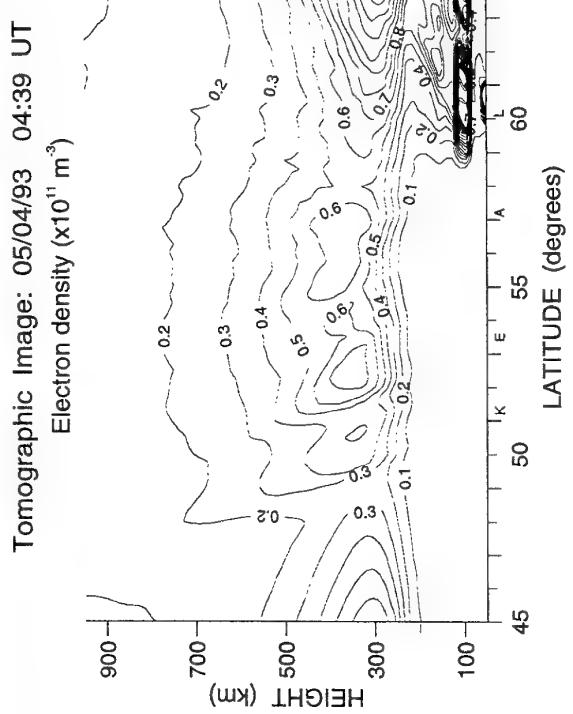
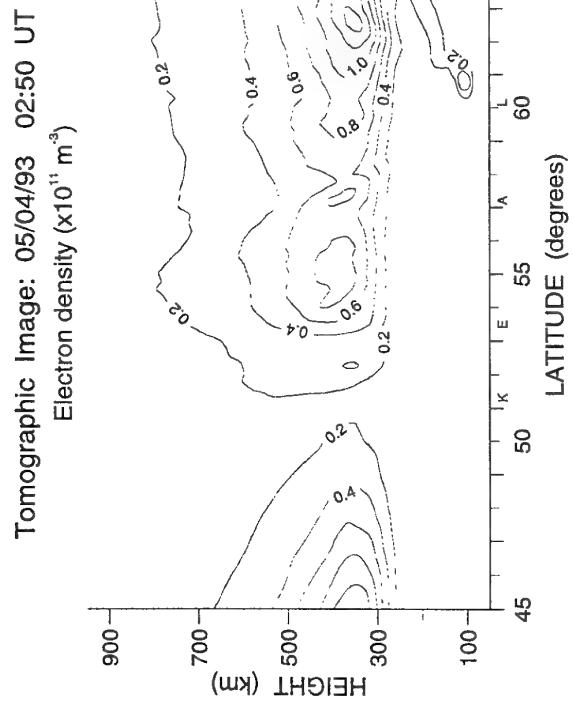
Tomographic Image: 04/04/93 15:35 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

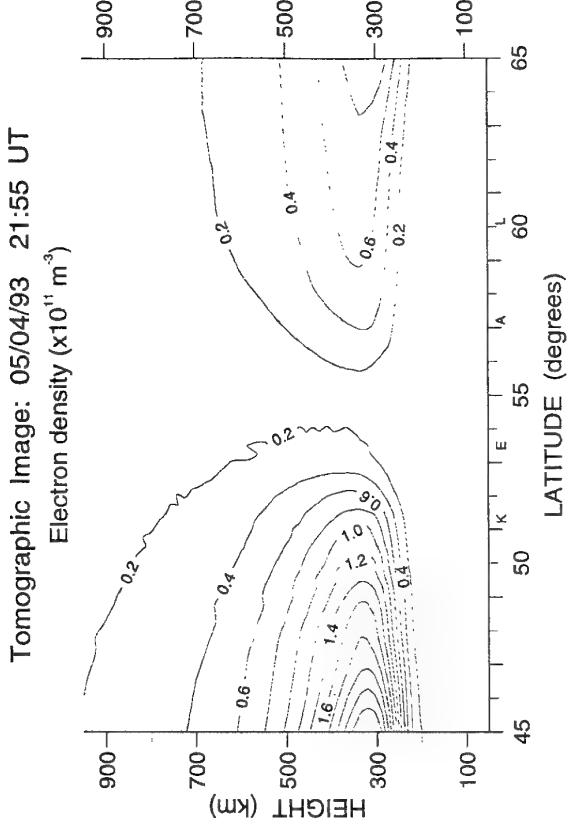
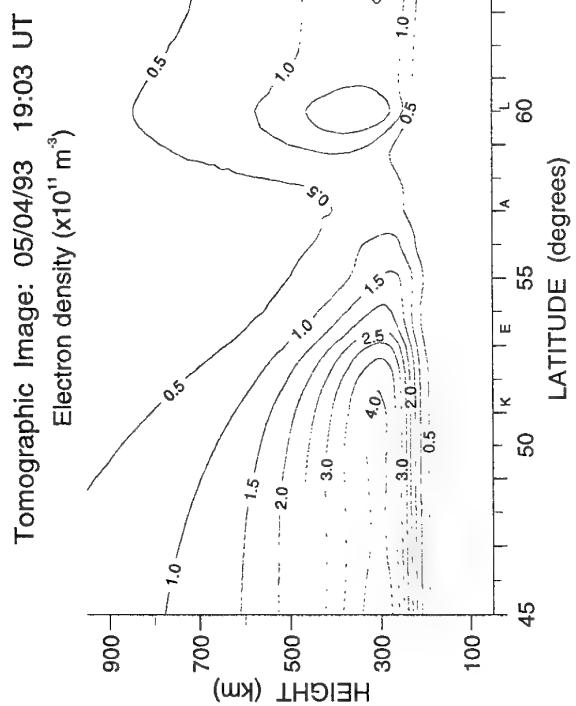
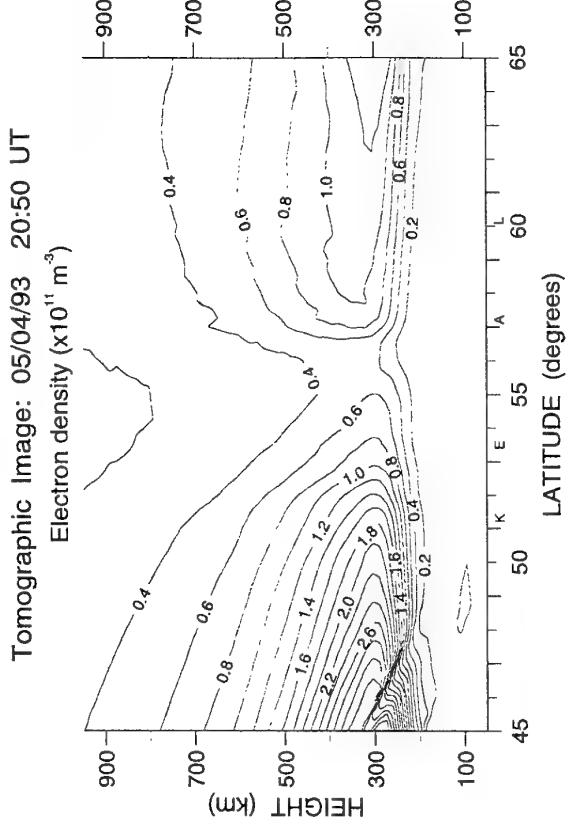
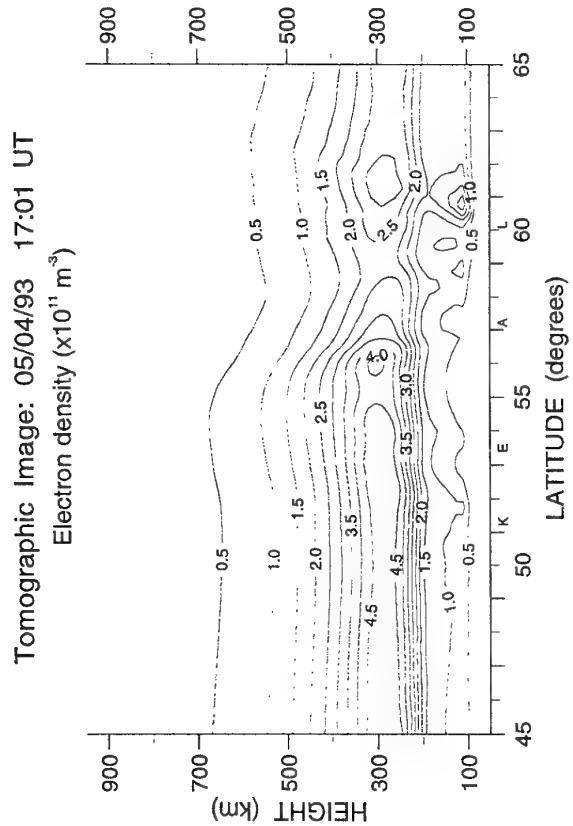


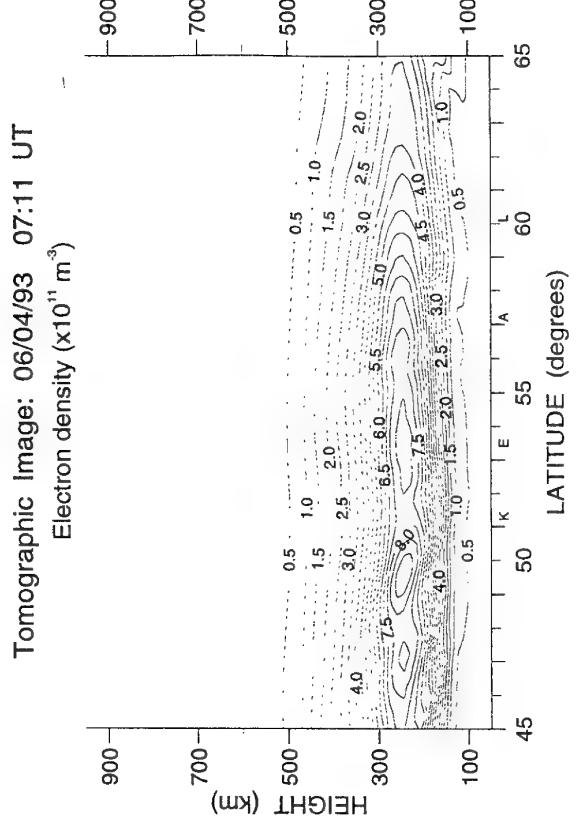
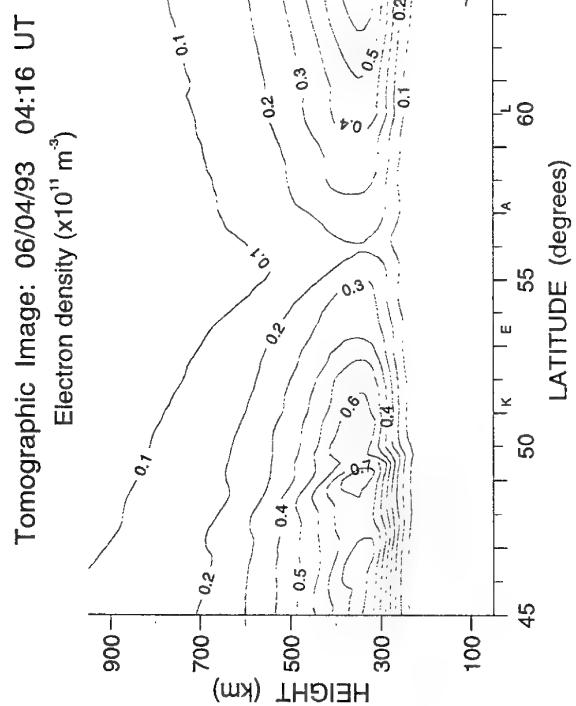
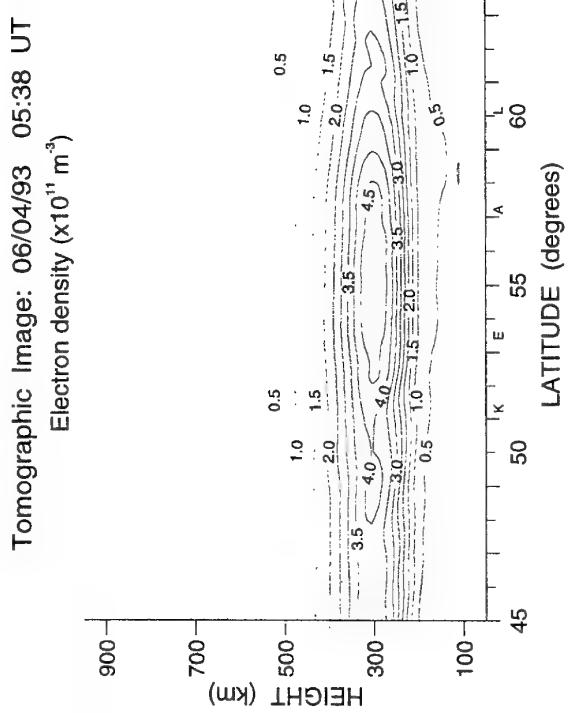
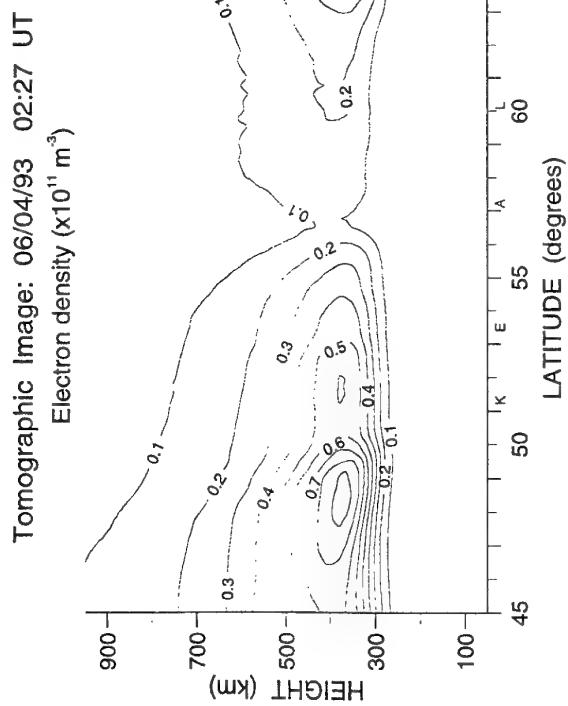
Tomographic Image: 04/04/93 18:46 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



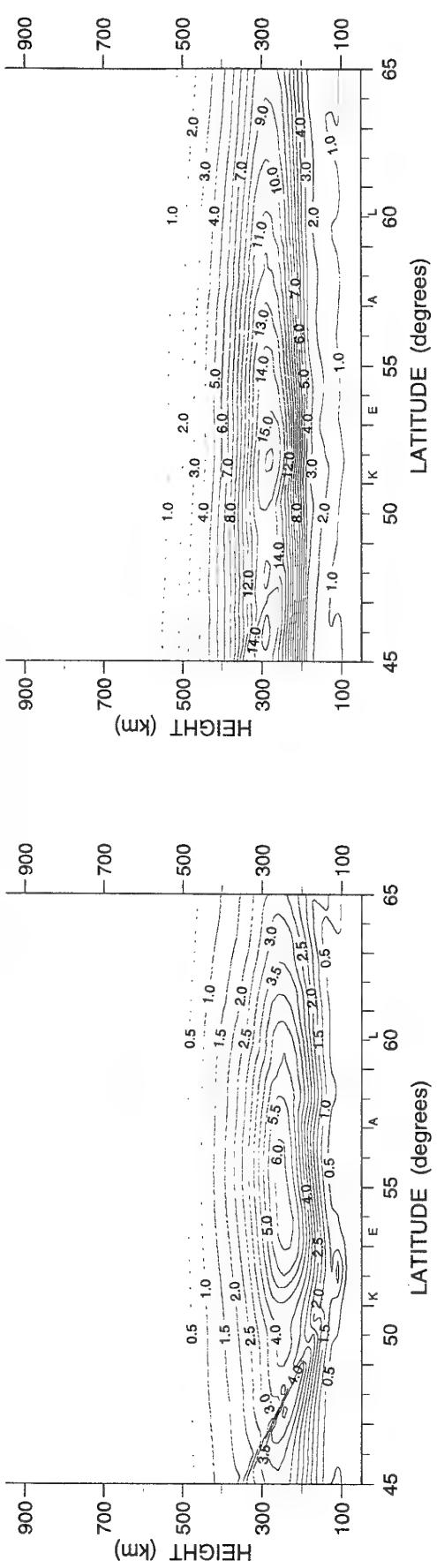




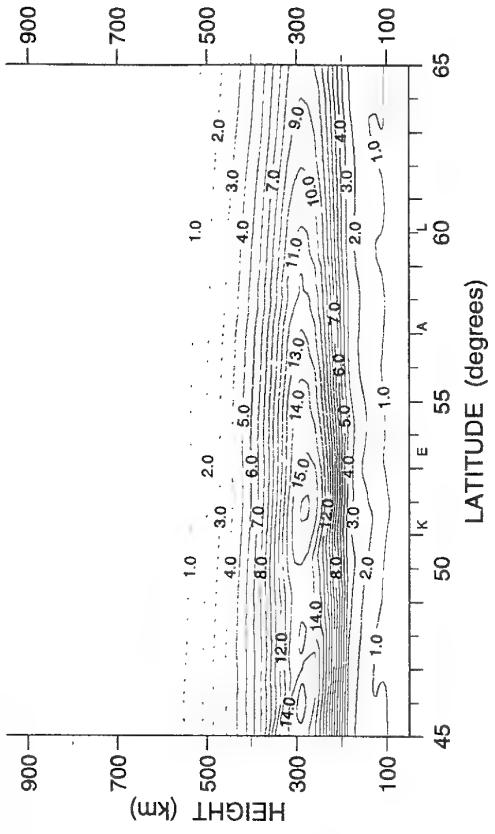




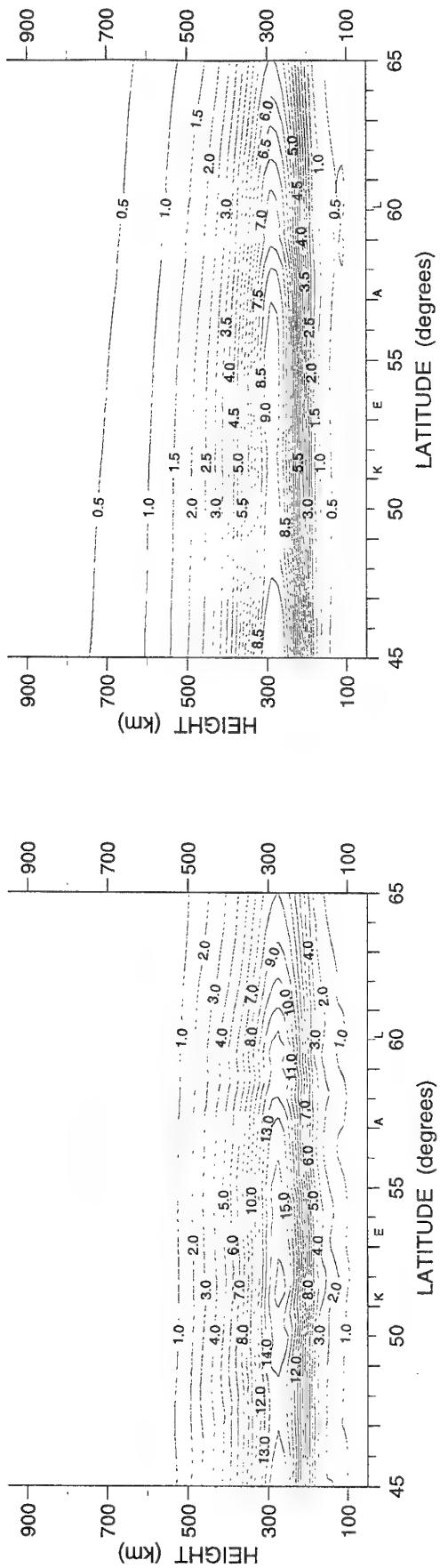
Tomographic Image: 06/04/93 07:27 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



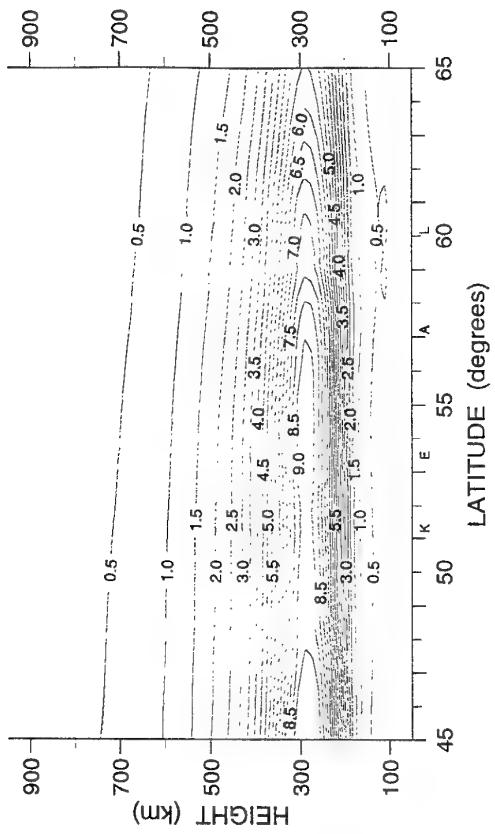
Tomographic Image: 06/04/93 12:02 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

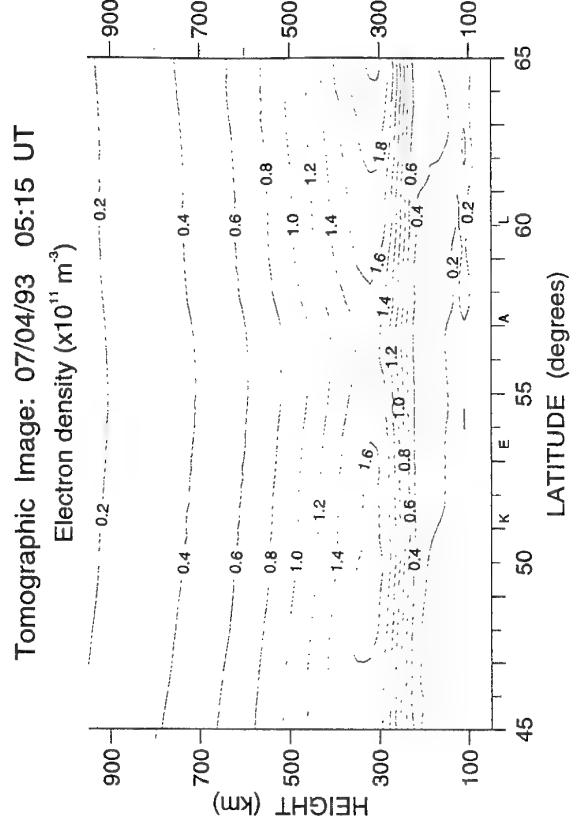
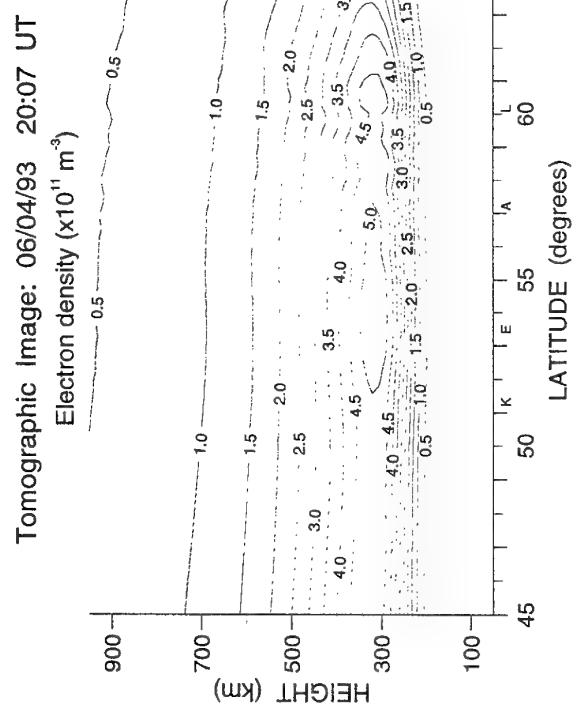
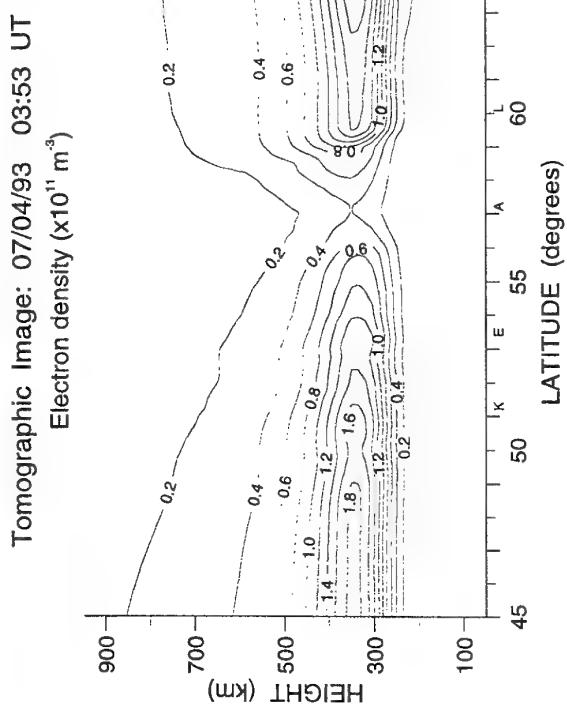
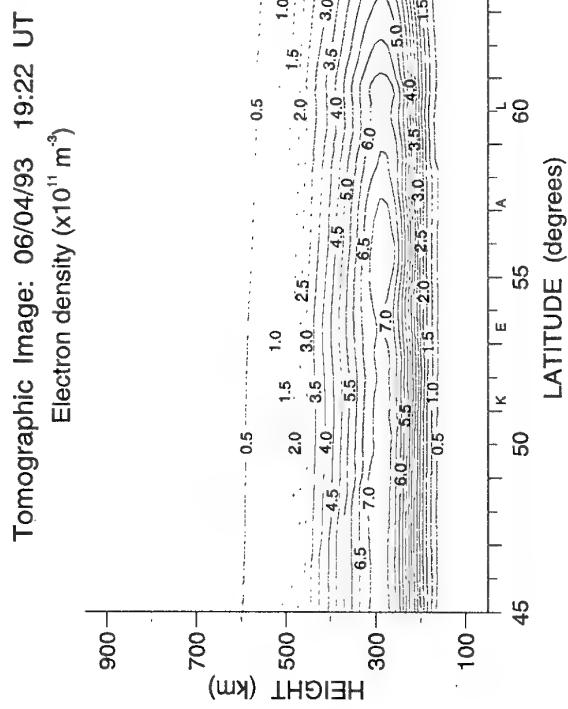


Tomographic Image: 06/04/93 10:13 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

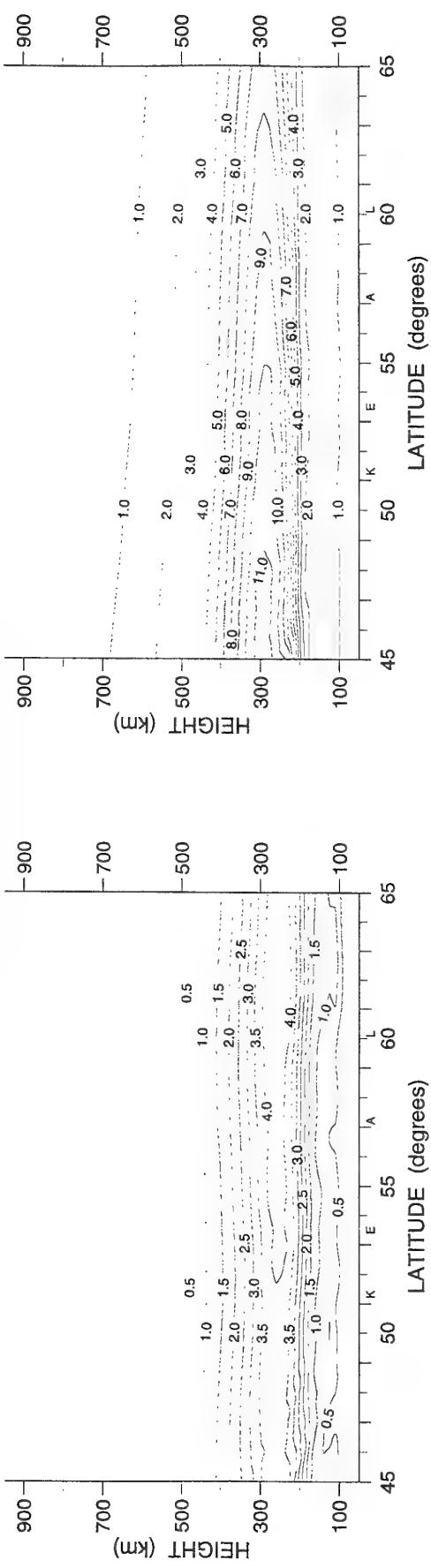


Tomographic Image: 06/04/93 17:59 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

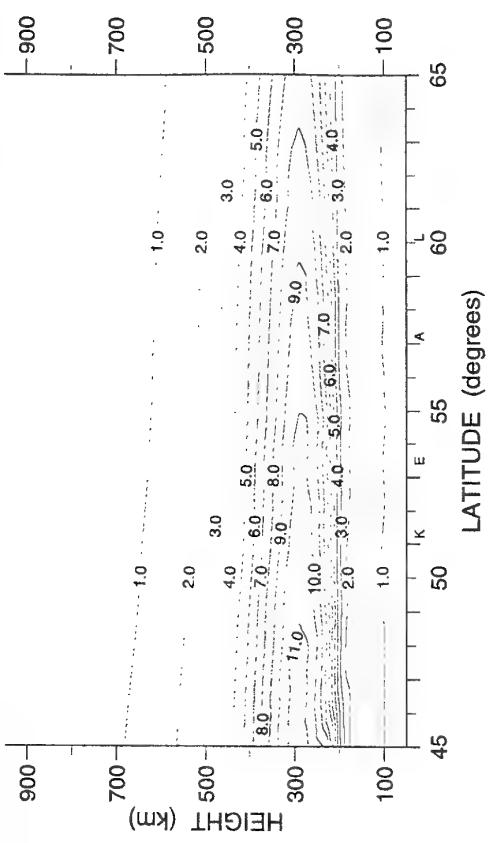




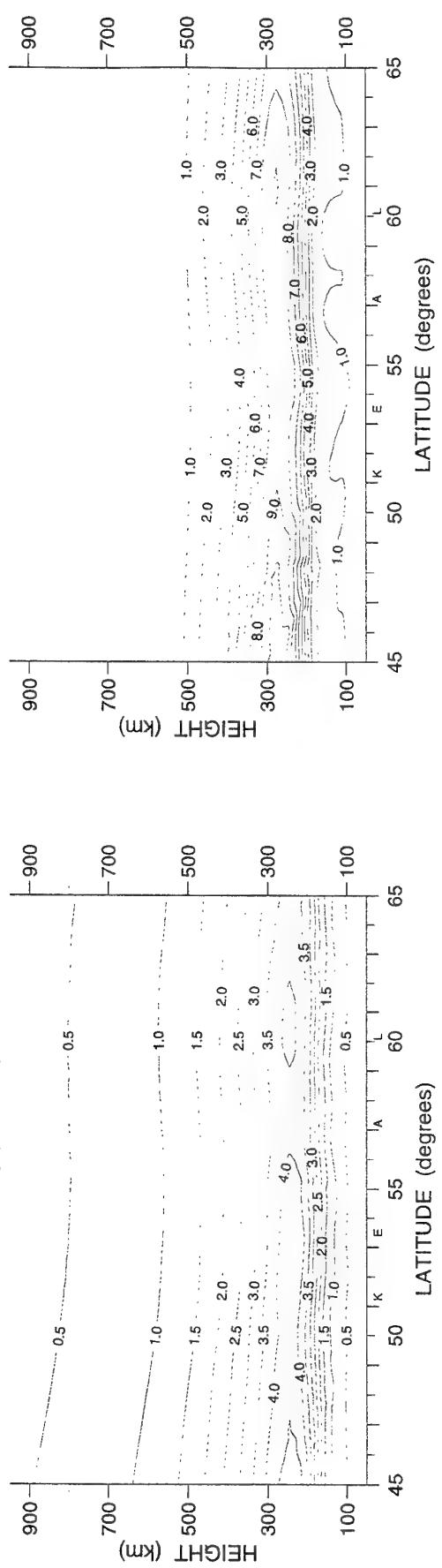
Tomographic Image: 07/04/93 07:04 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



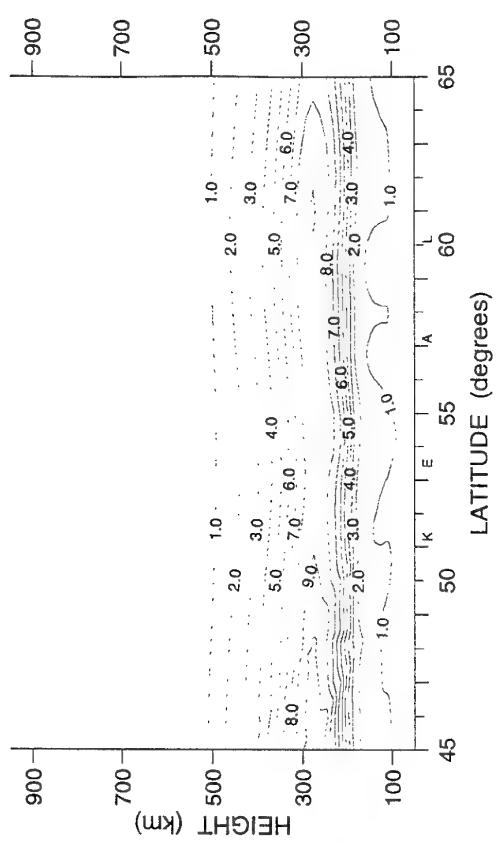
Tomographic Image: 07/04/93 11:34 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



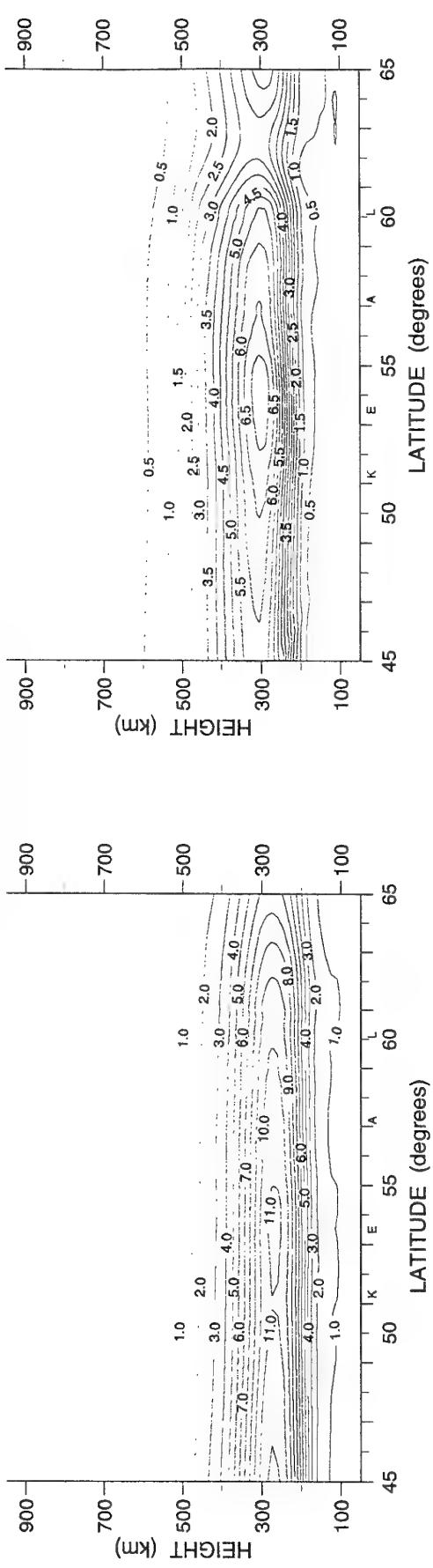
Tomographic Image: 07/04/93 08:15 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



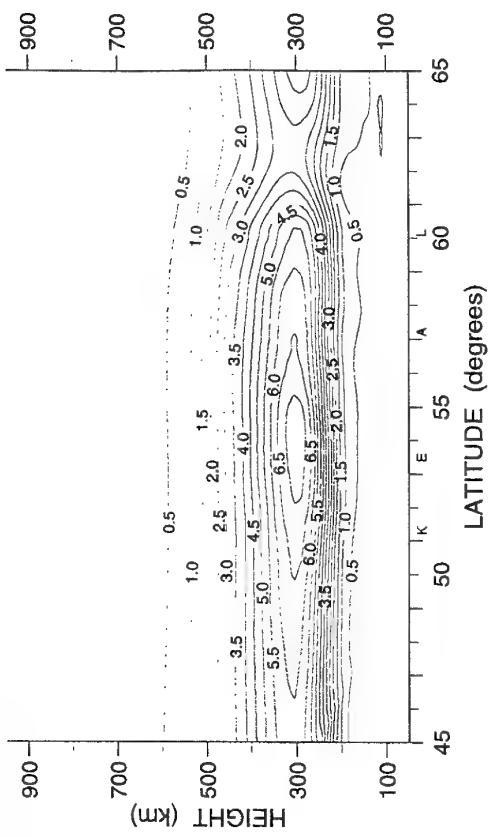
Tomographic Image: 07/04/93 14:26 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



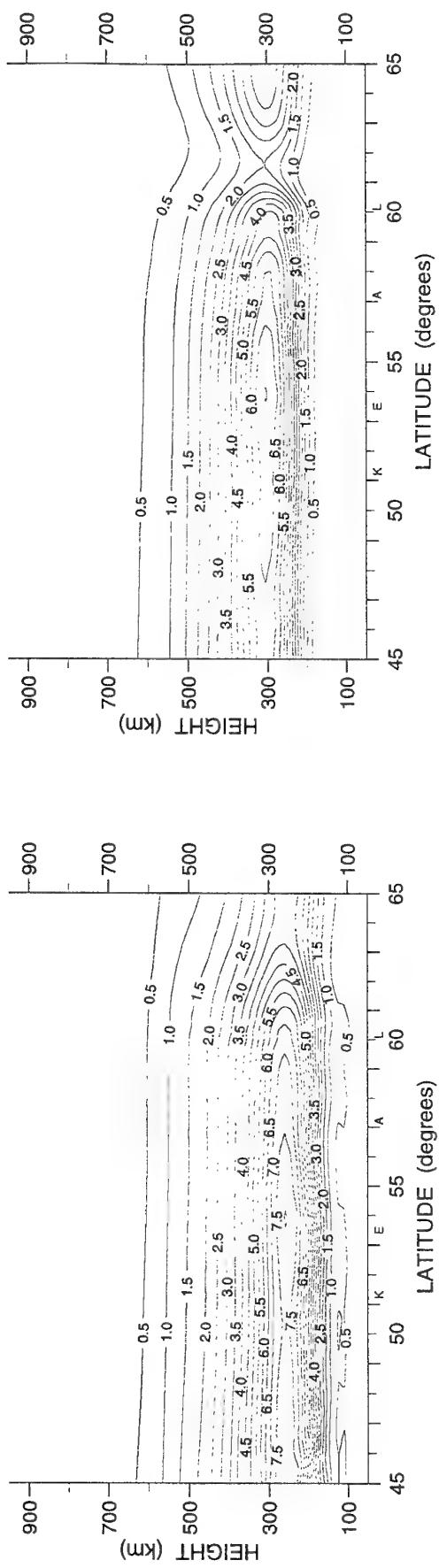
Tomographic Image: 07/04/93 16:15 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



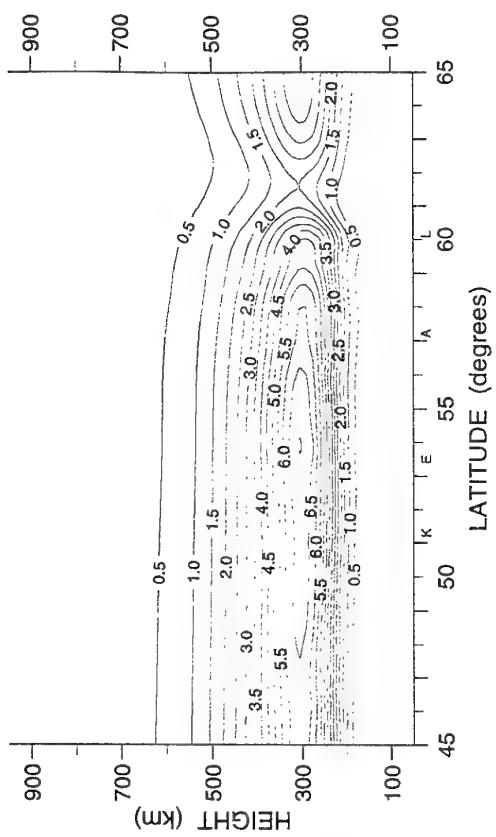
Tomographic Image: 07/04/93 18:39 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

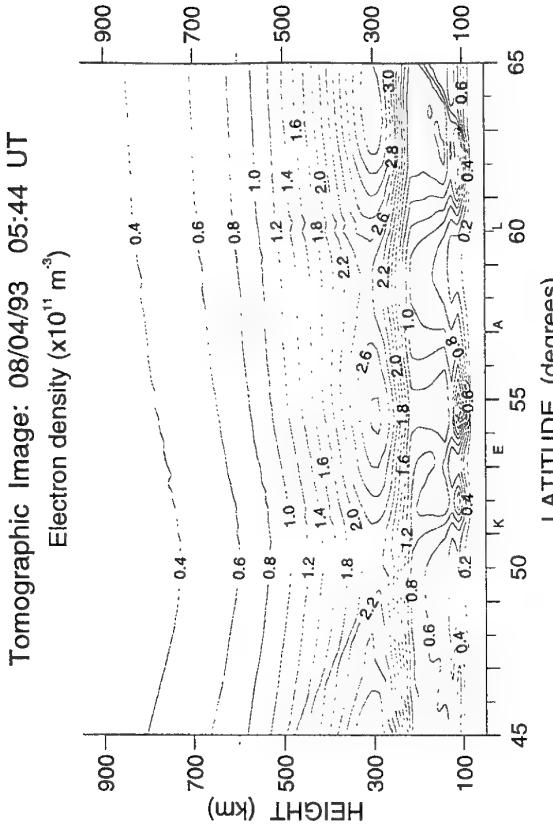
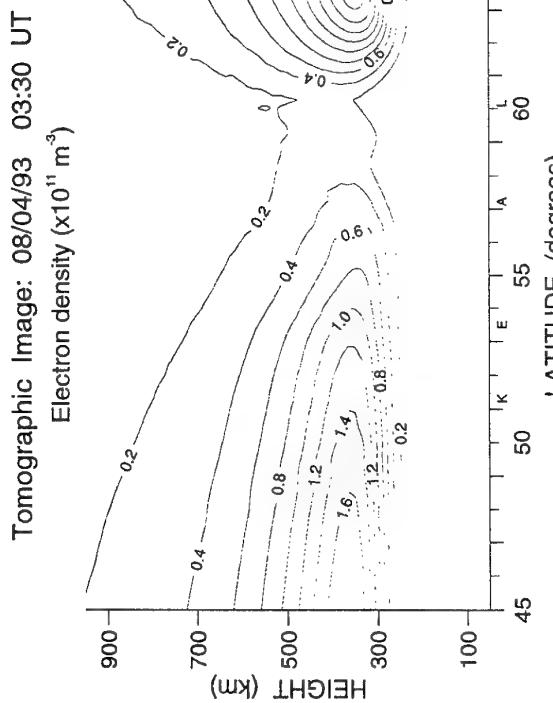
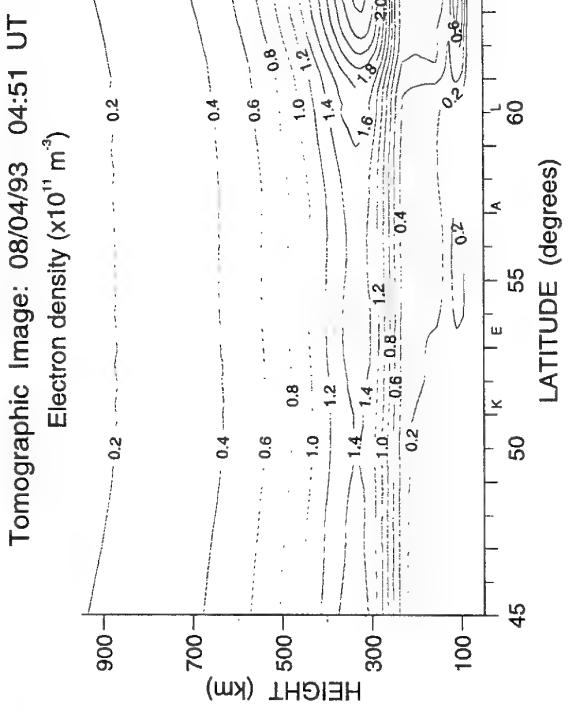
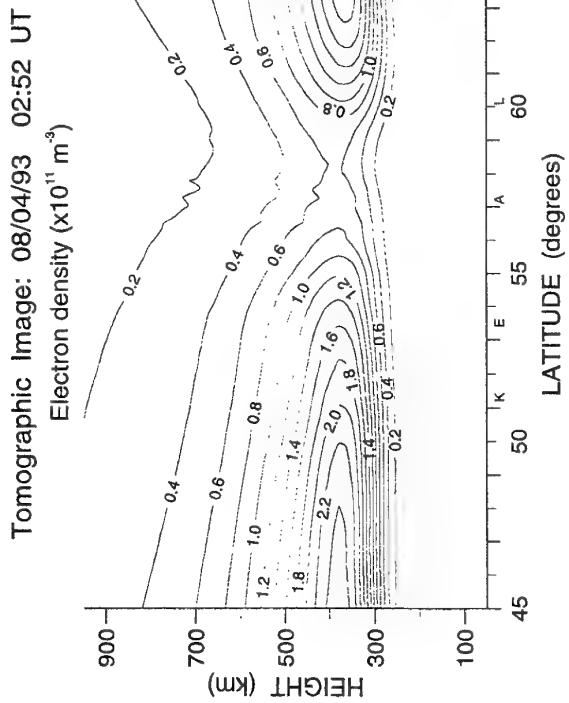


Tomographic Image: 07/04/93 17:36 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

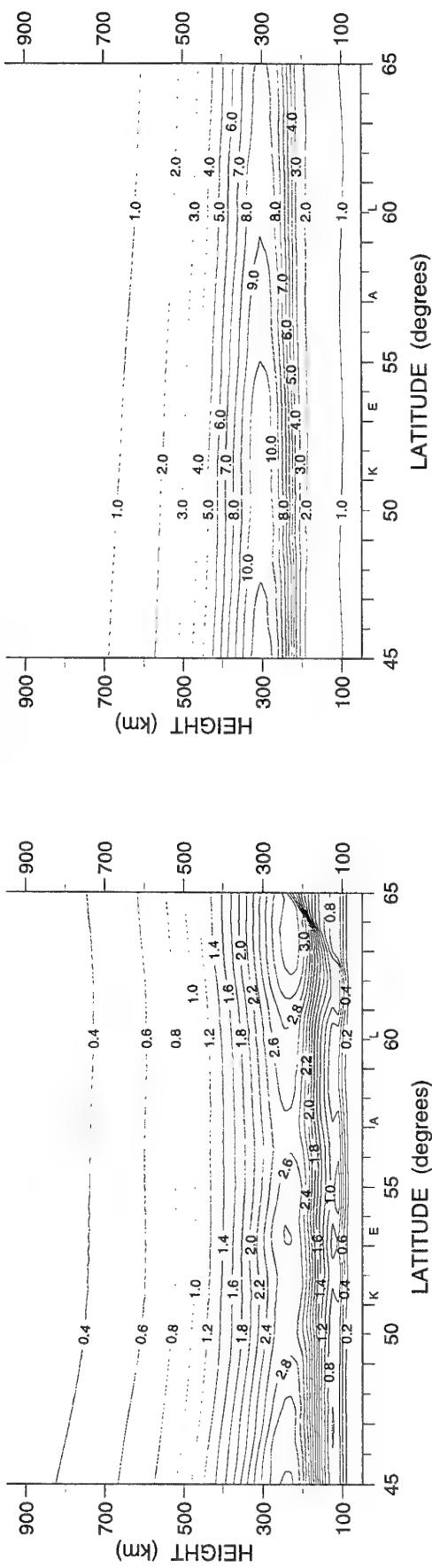


Tomographic Image: 07/04/93 19:24 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

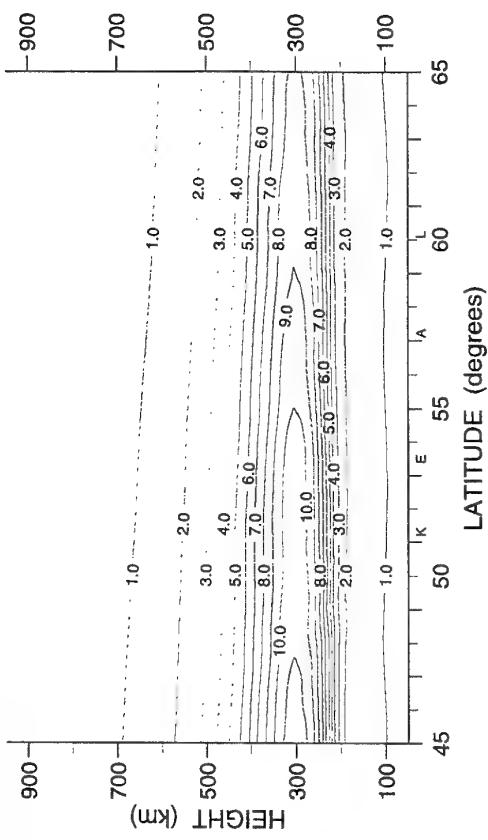




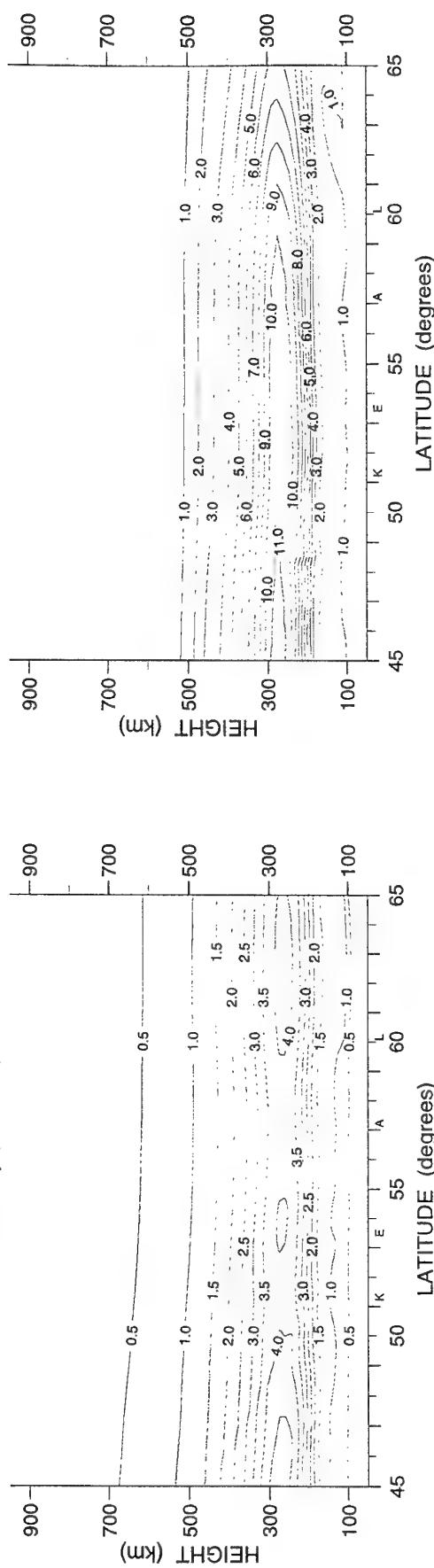
Tomographic Image: 08/04/93 06:29 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



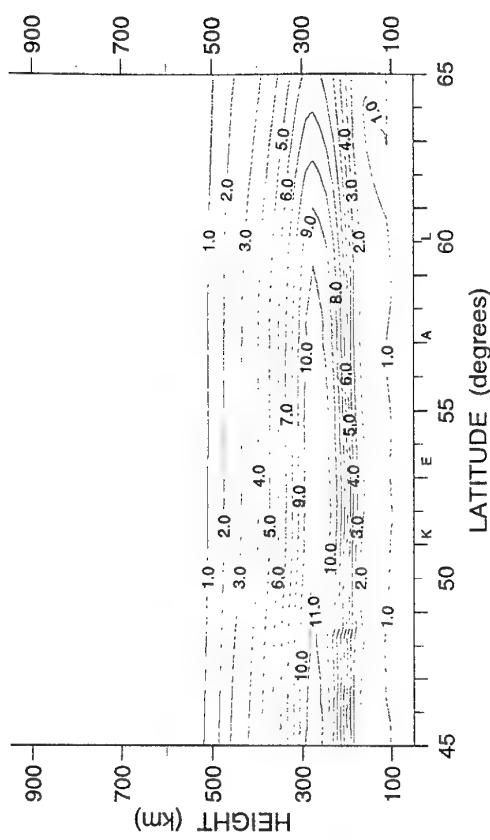
Tomographic Image: 08/04/93 11:06 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



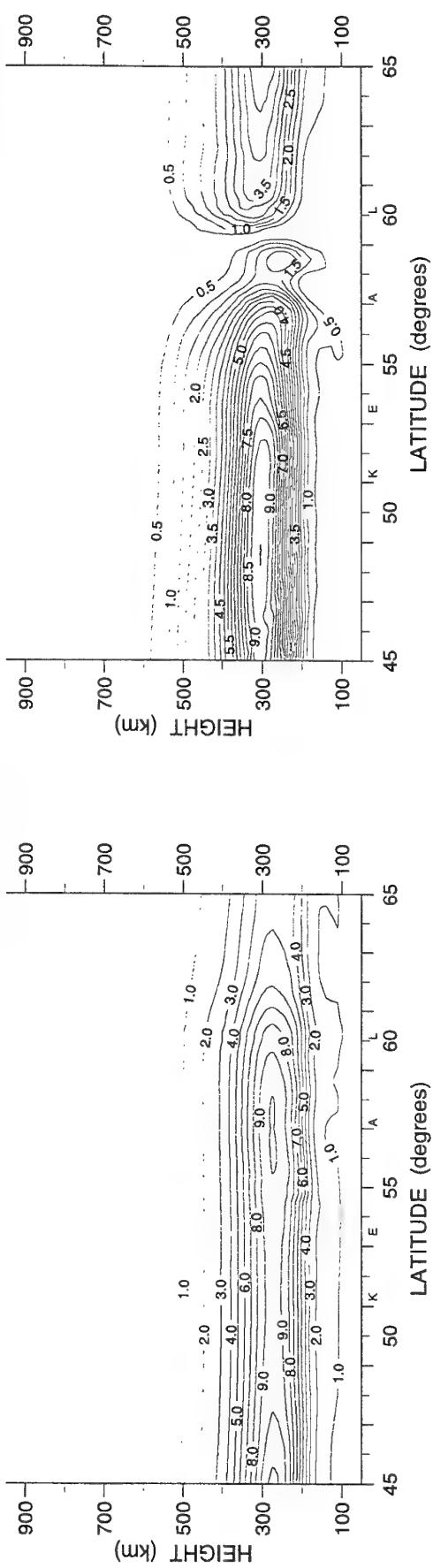
Tomographic Image: 08/04/93 07:32 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



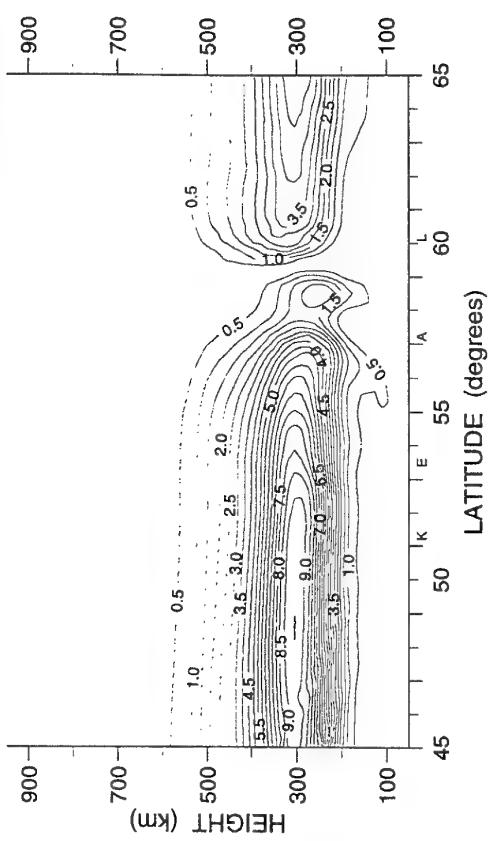
Tomographic Image: 08/04/93 15:02 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



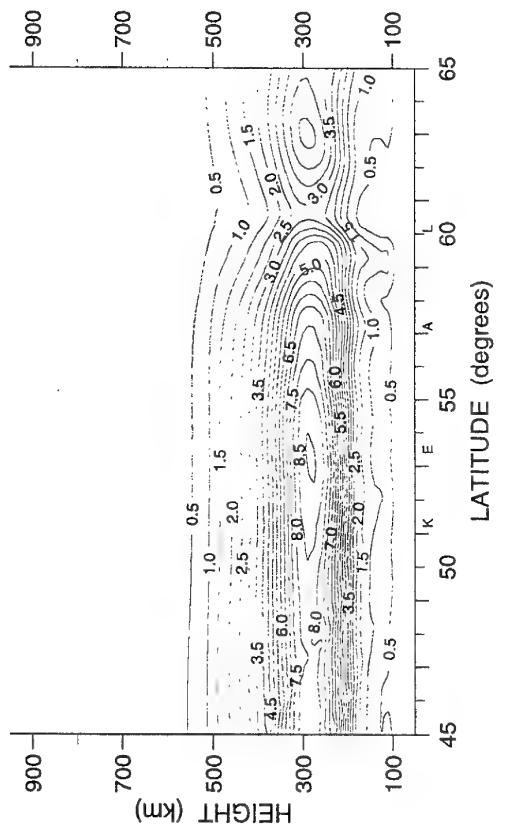
Tomographic Image: 08/04/93 15:52 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



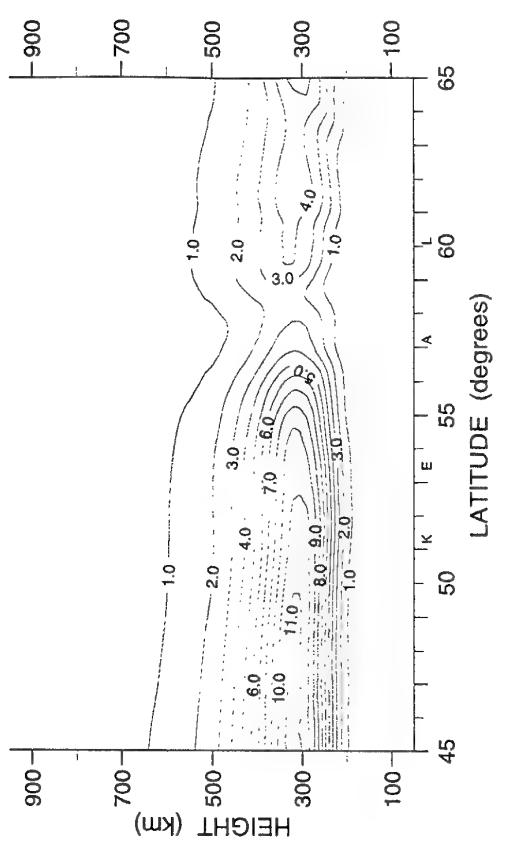
Tomographic Image: 08/04/93 18:40 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

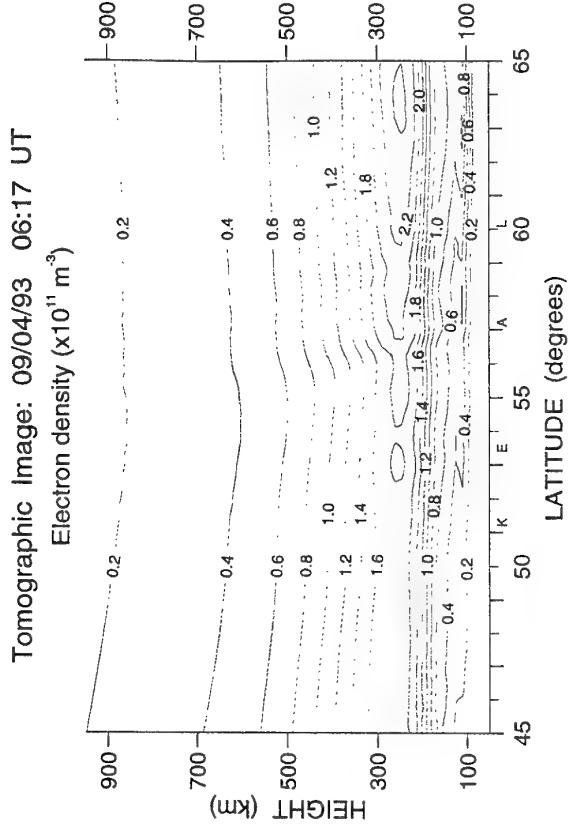
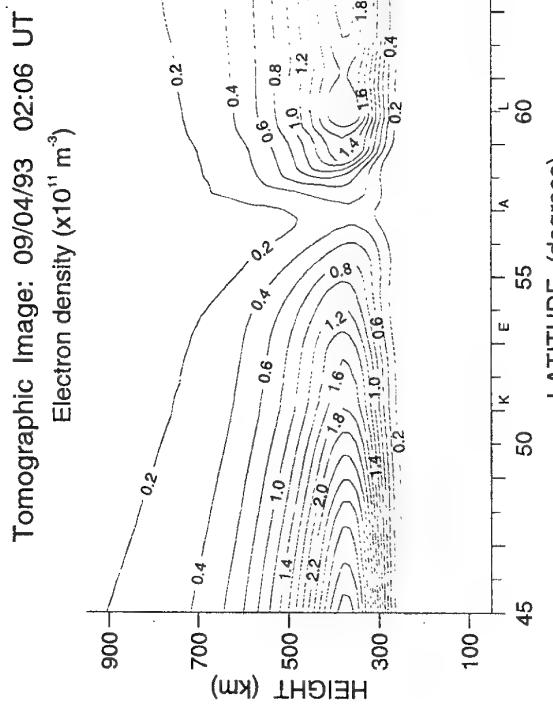
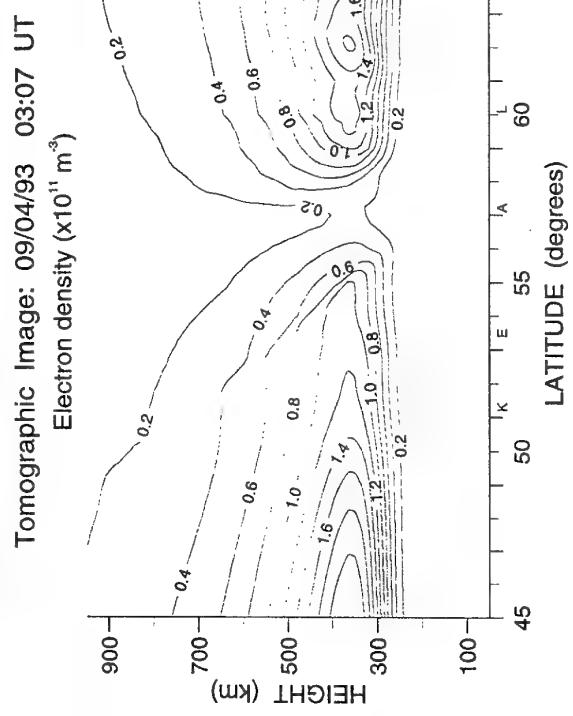
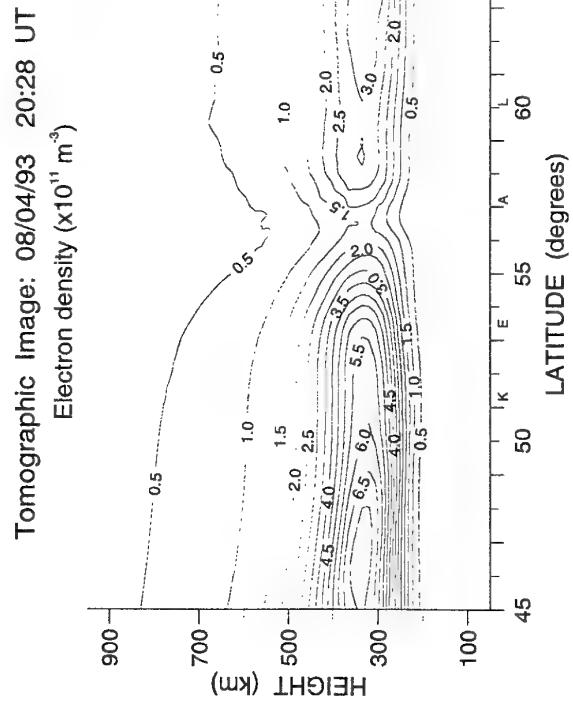


Tomographic Image: 08/04/93 17:13 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

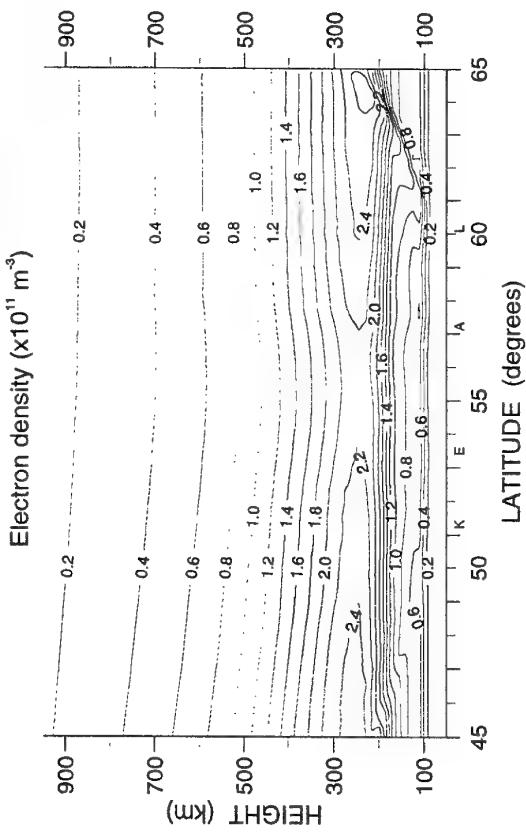


Tomographic Image: 08/04/93 19:02 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

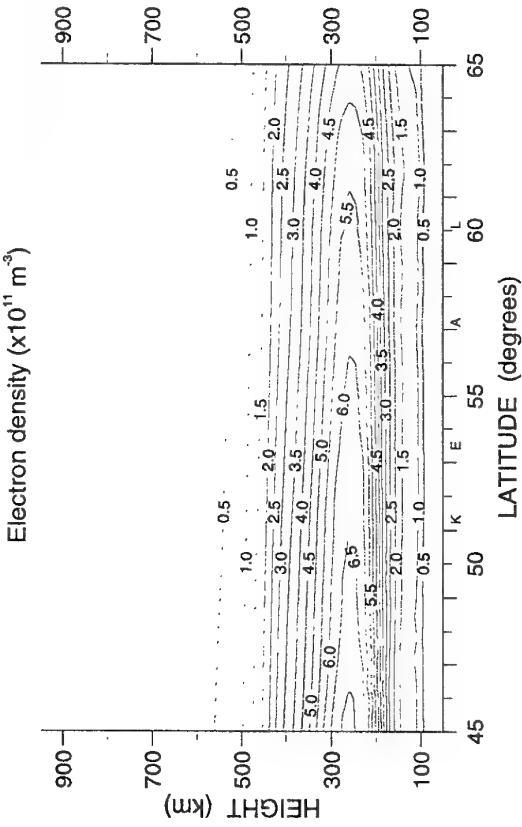




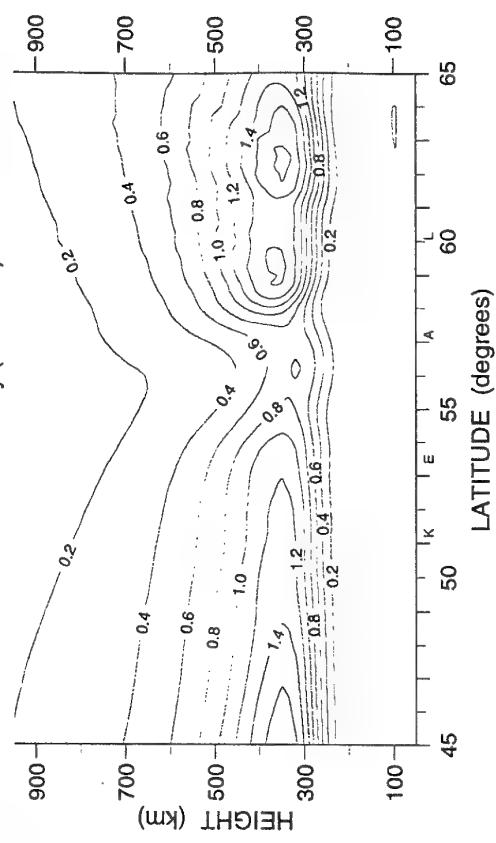
Tomographic Image: 09/04/93 06:49 UT



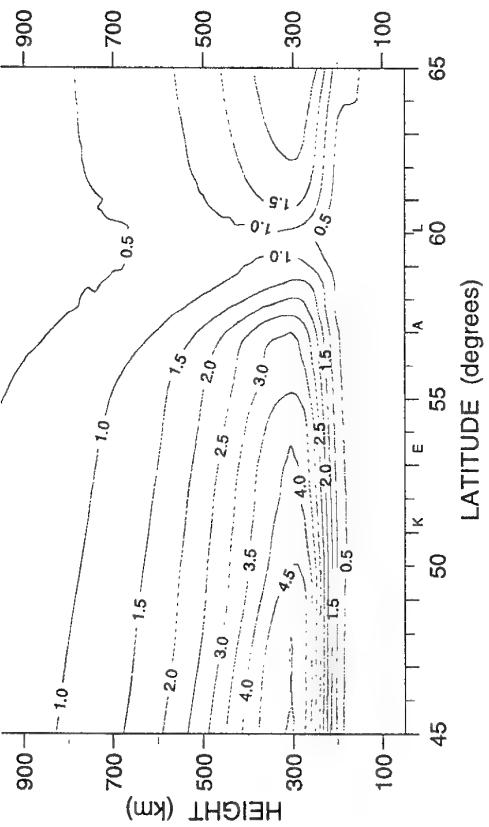
**Tomographic Image: 09/04/93 15:29 UT**



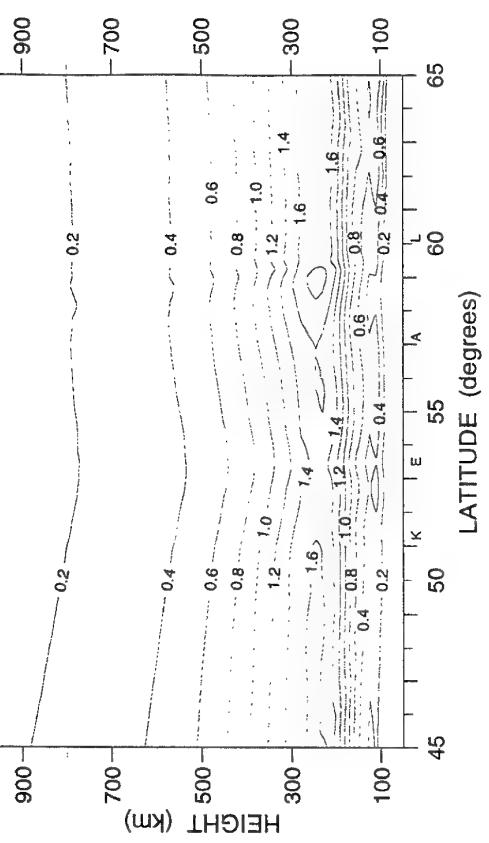
**Tomographic Image: 10/04/93 02:44 UT**



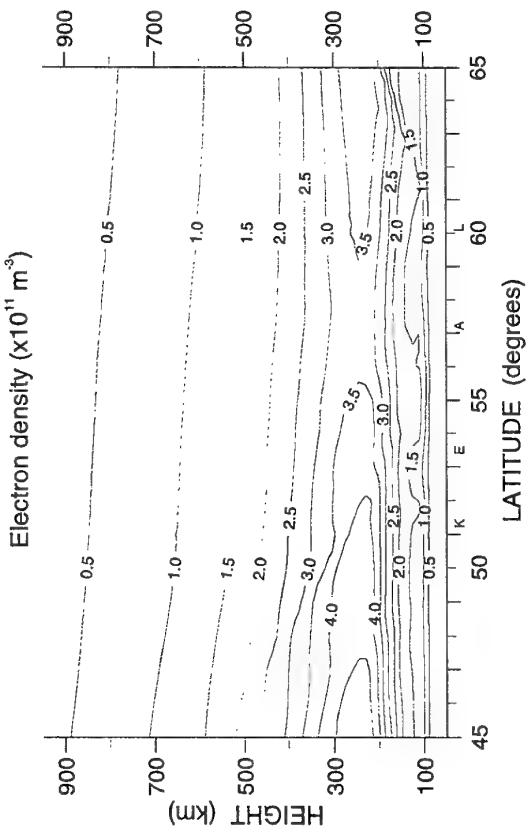
**Tomographic Image: 09/04/93 19:00 UT**



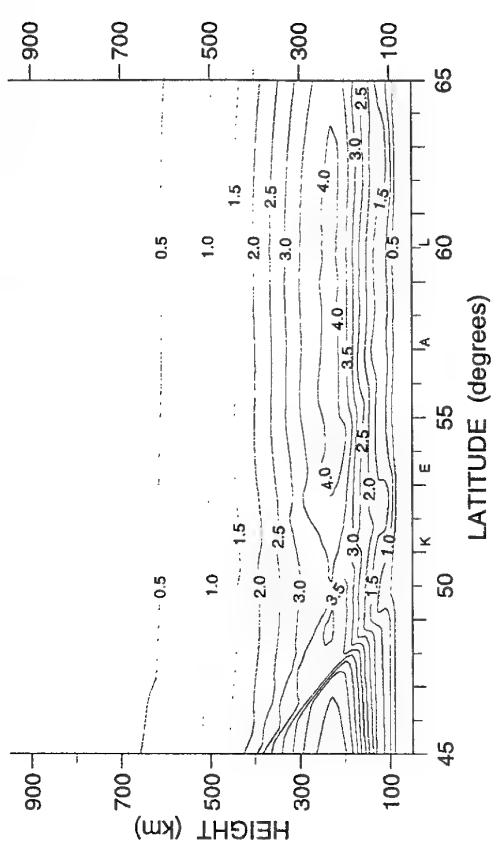
**Tomographic Image: 10/04/93 05:54 UT**



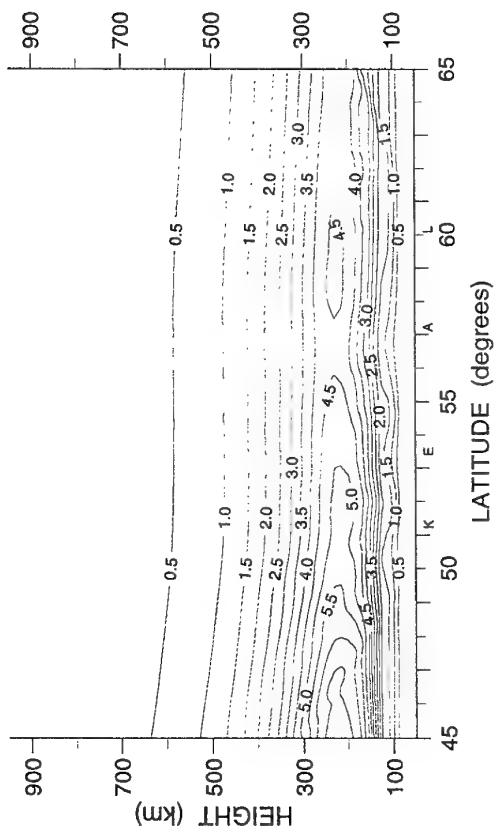
Tomographic Image: 10/04/93 10:11 UT



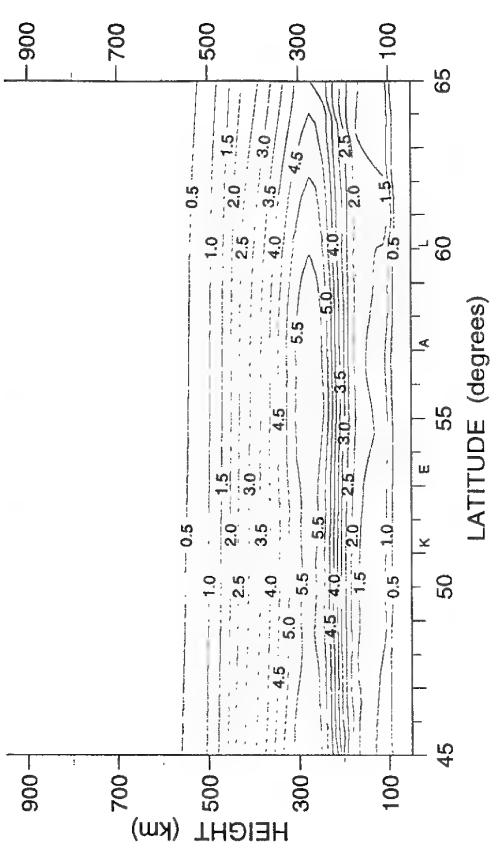
Tomographic Image: 10/04/93 13:32 UT



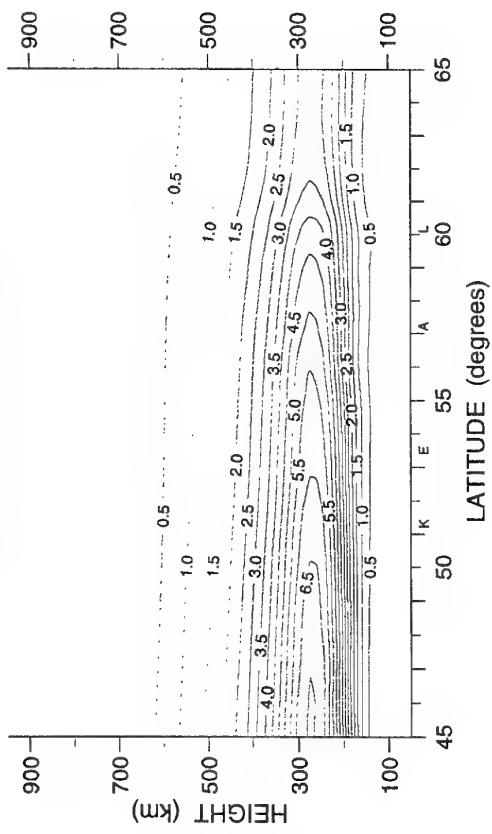
Tomographic Image: 10/04/93 11:60 UT

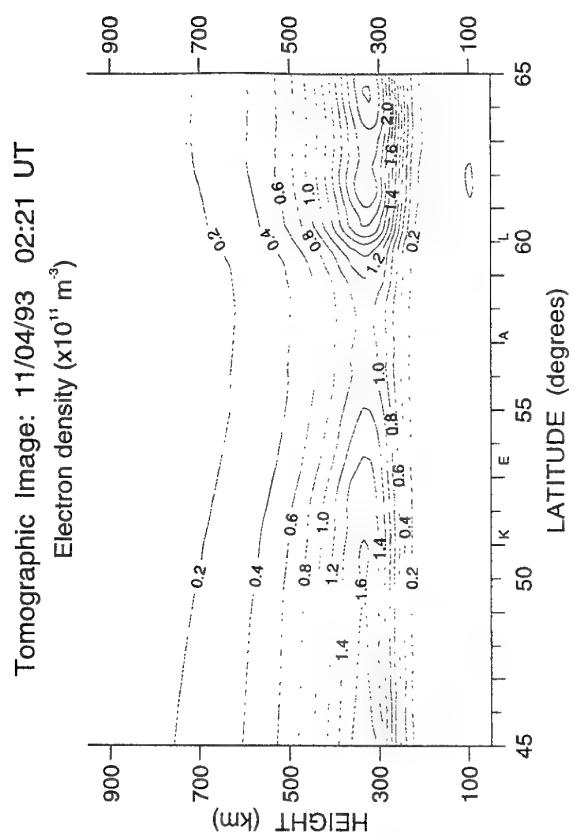
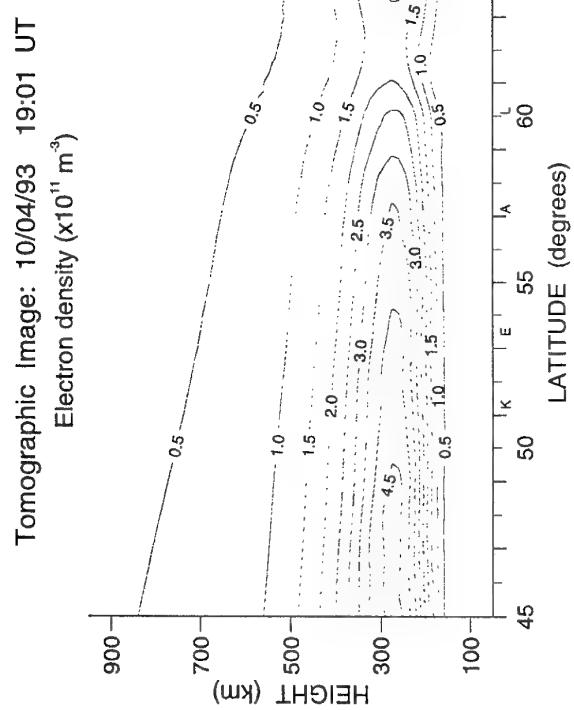
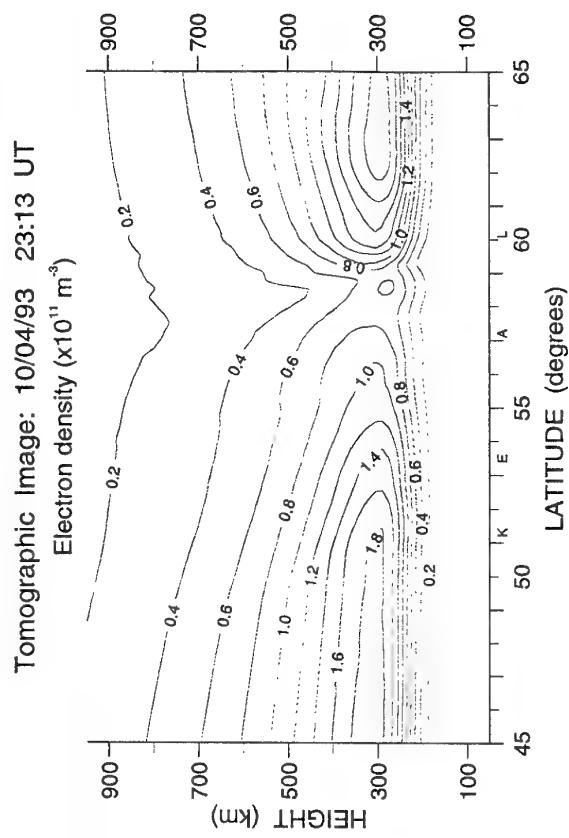
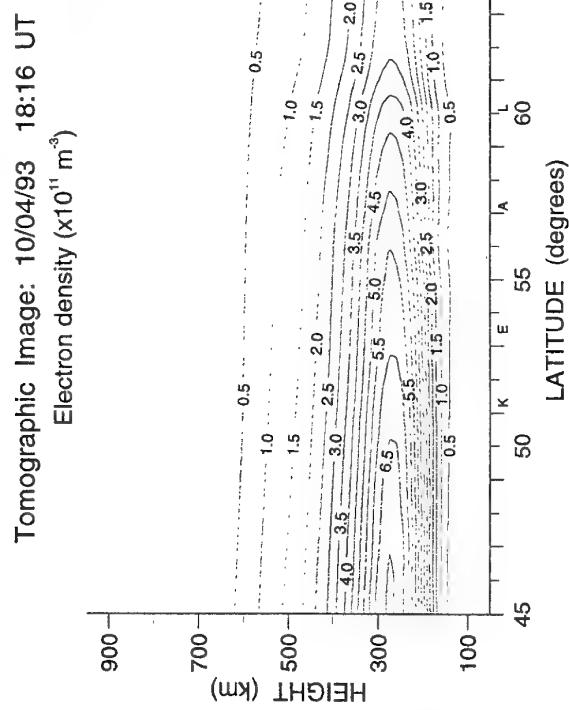


Tomographic Image: 10/04/93 15:06 UT

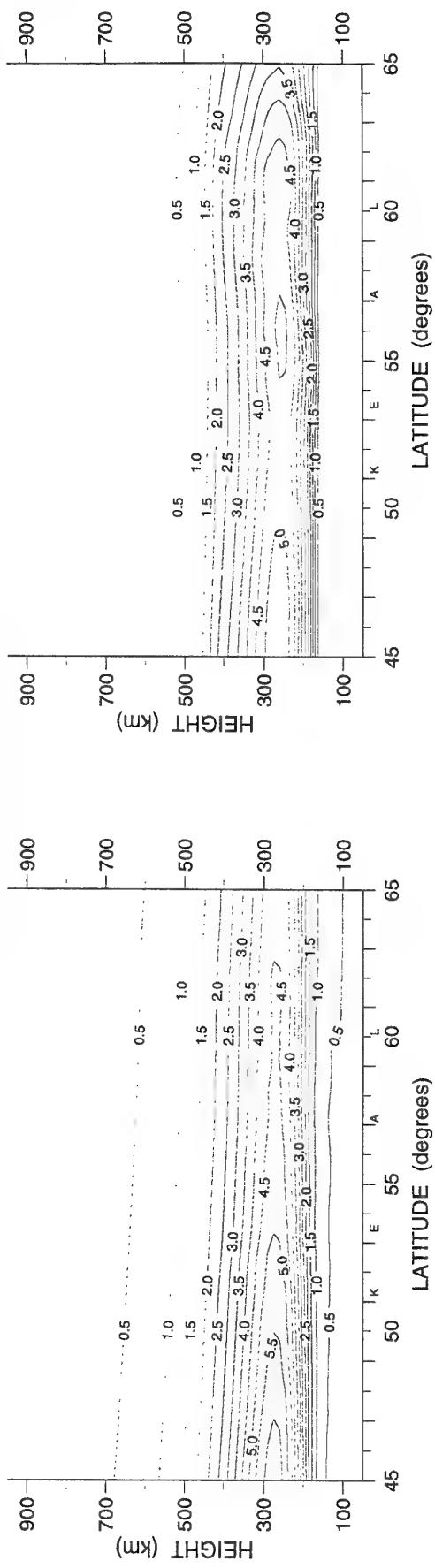


Tomographic Image: 10/04/93 18:16 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

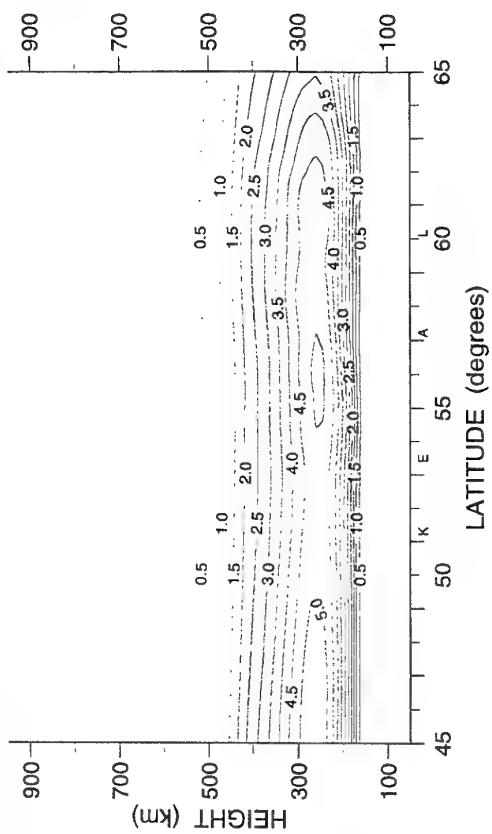




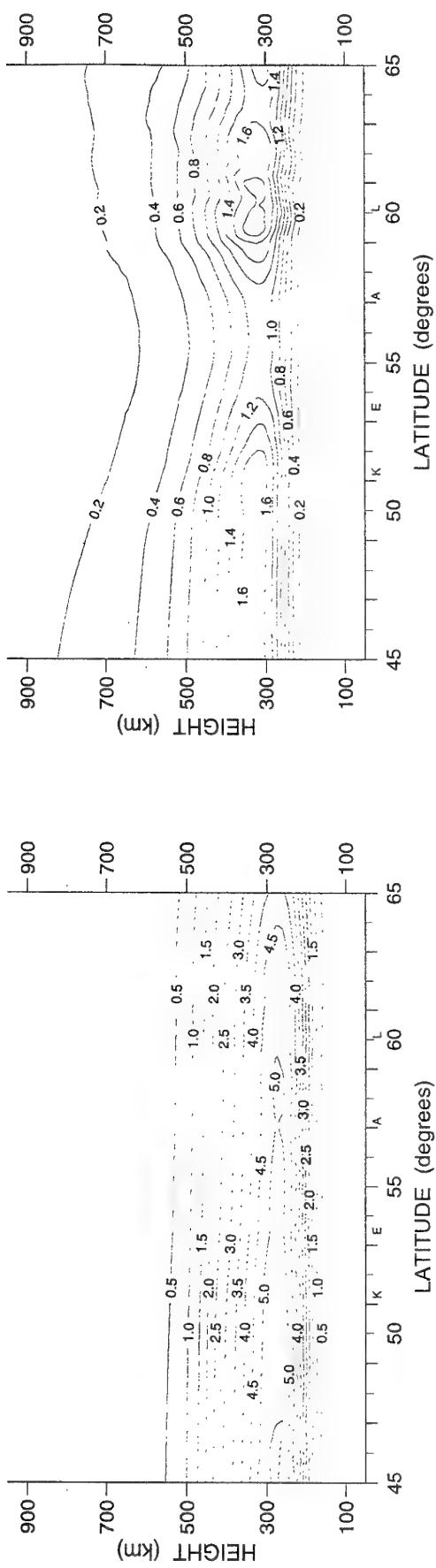
Tomographic Image: 11/04/93 17:53 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



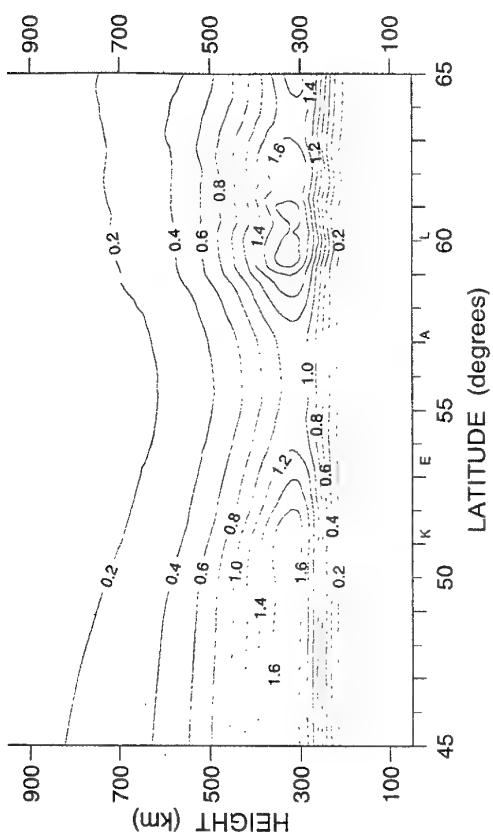
Tomographic Image: 11/04/93 20:05 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



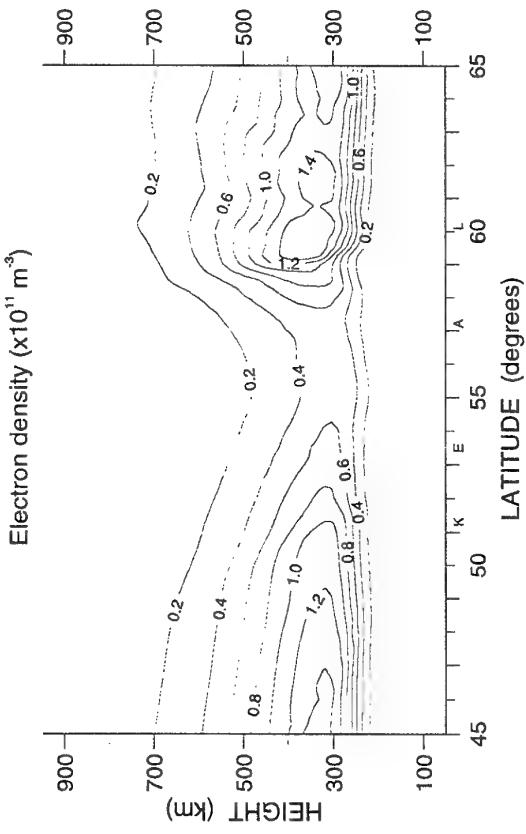
Tomographic Image: 11/04/93 19:22 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



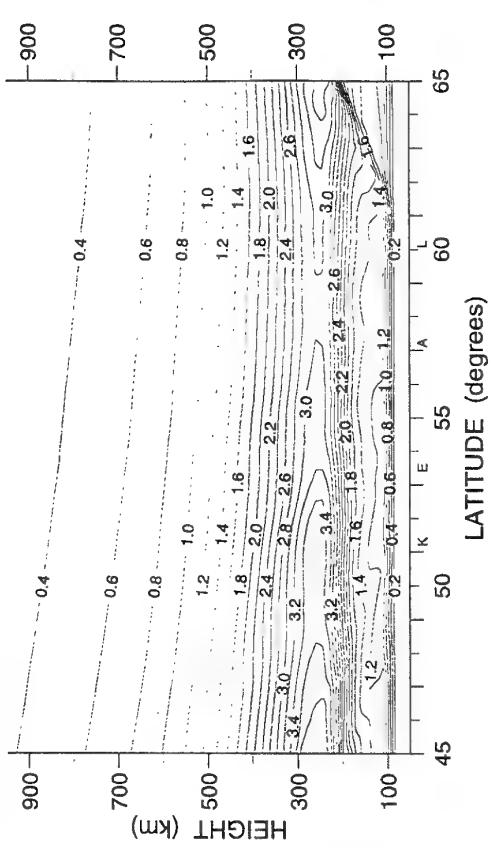
Tomographic Image: 12/04/93 01:38 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



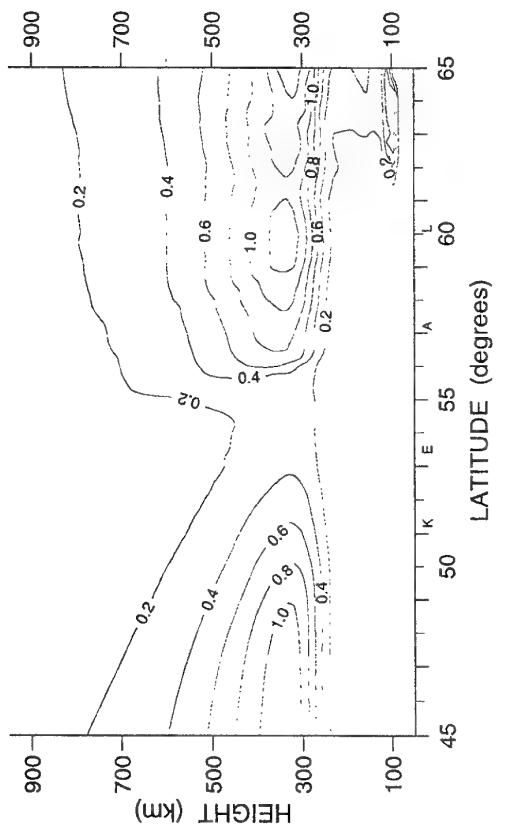
Tomographic Image: 12/04/93 01:58 UT



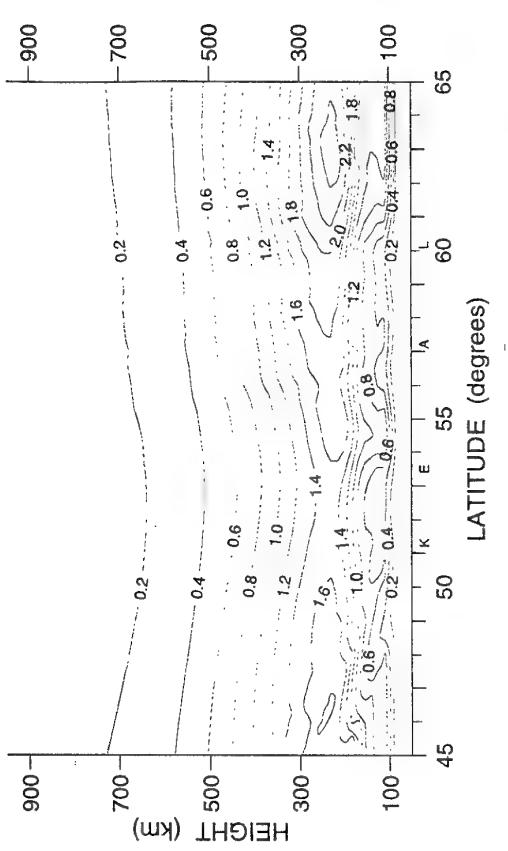
Tomographic Image: 12/04/93 11:04 UT



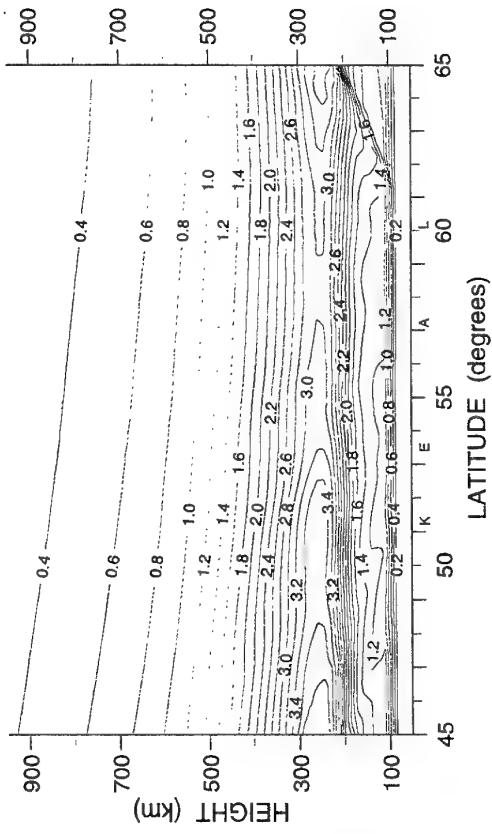
Tomographic Image: 12/04/93 03:47 UT



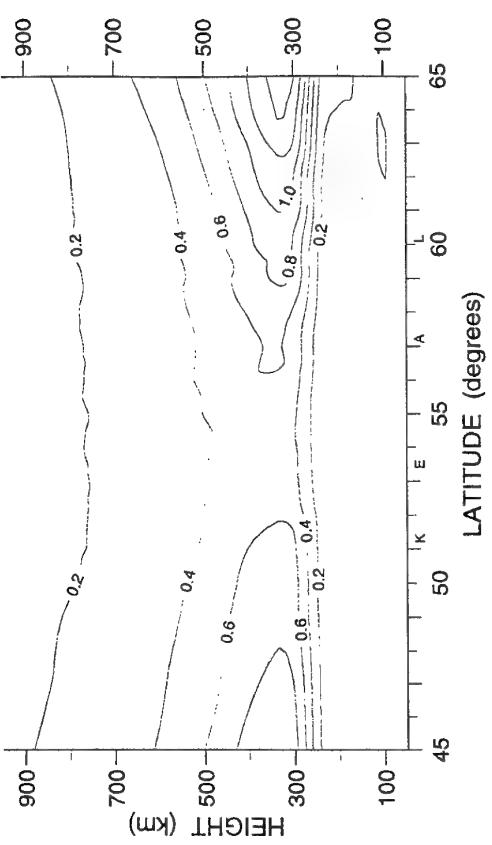
Tomographic Image: 12/04/93 06:57 UT



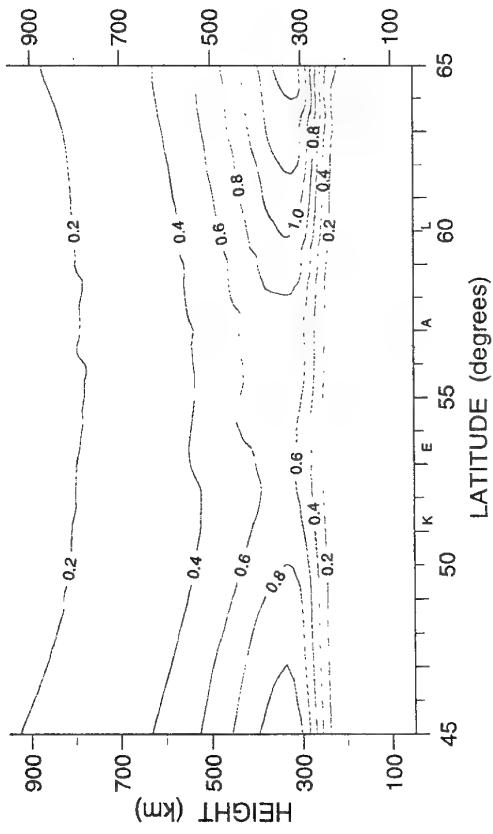
Tomographic Image: 12/04/93 11:04 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



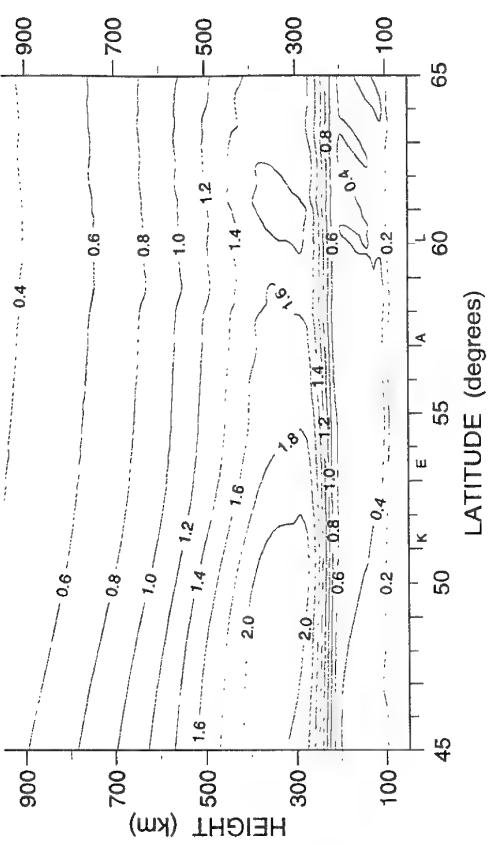
Tomographic Image: 13/04/93 03:24 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



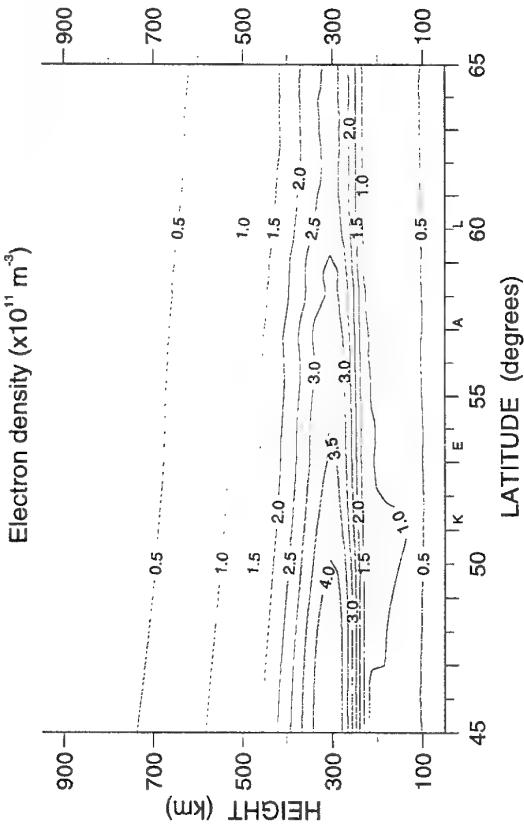
Tomographic Image: 13/04/93 02:40 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



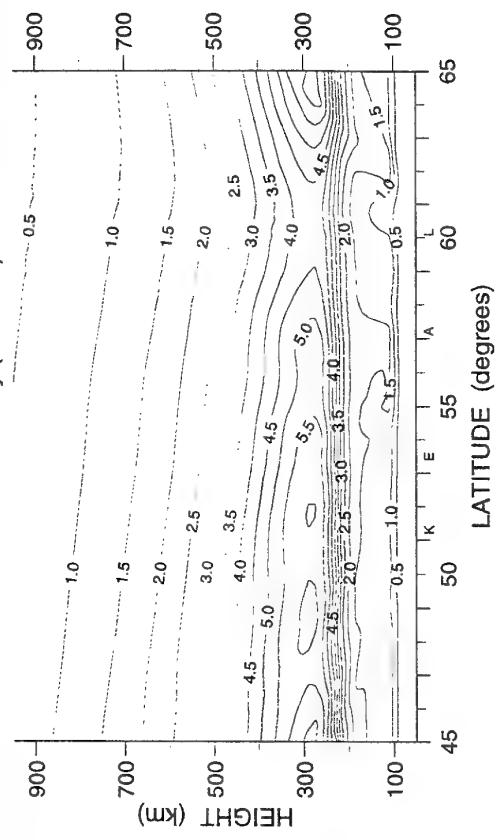
Tomographic Image: 13/04/93 06:27 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



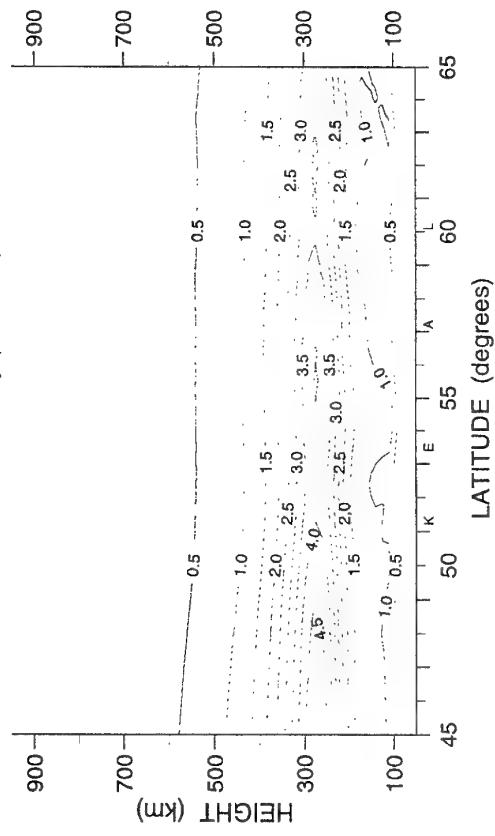
Tomographic Image: 13/04/93 07:31 UT

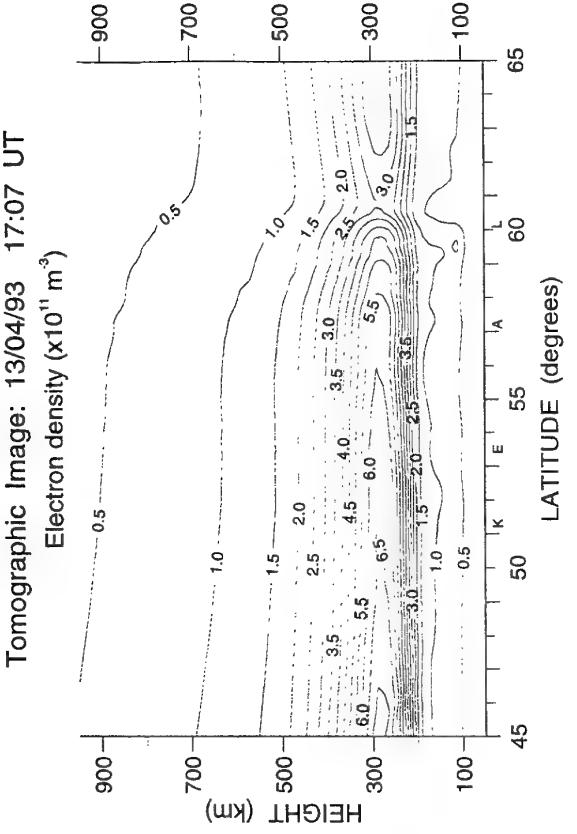
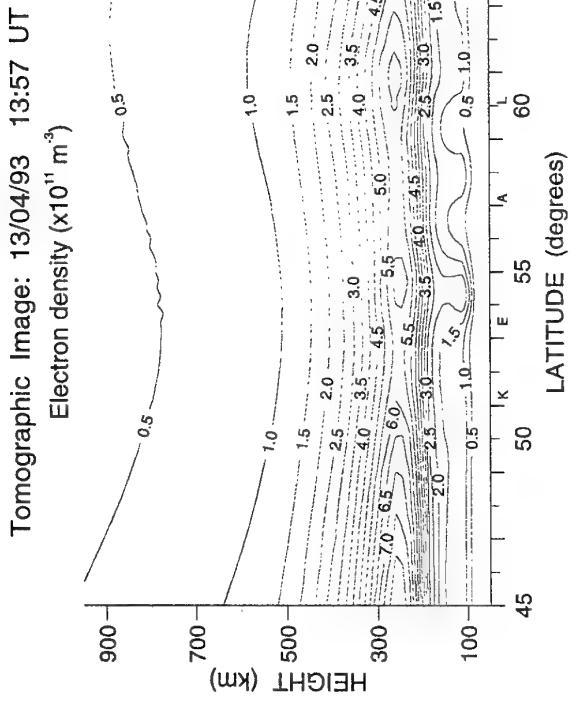
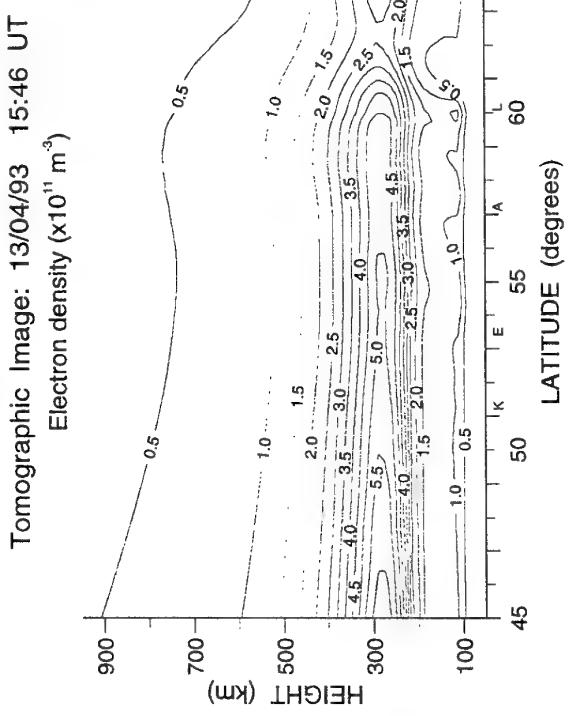
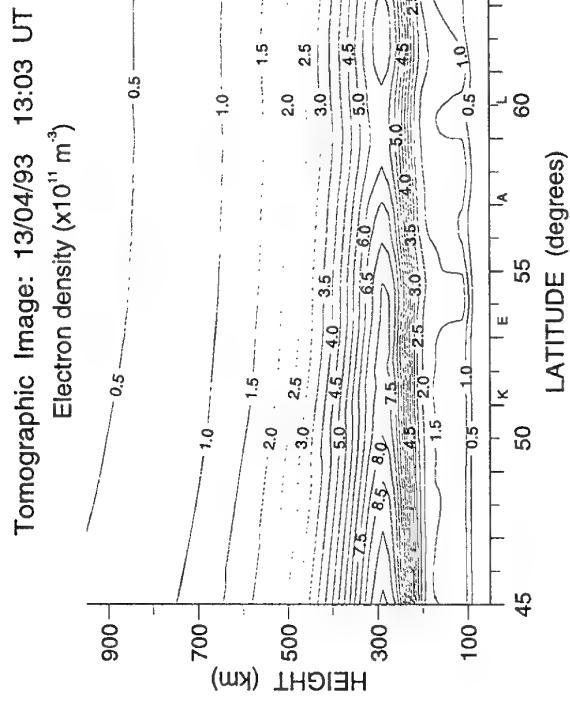


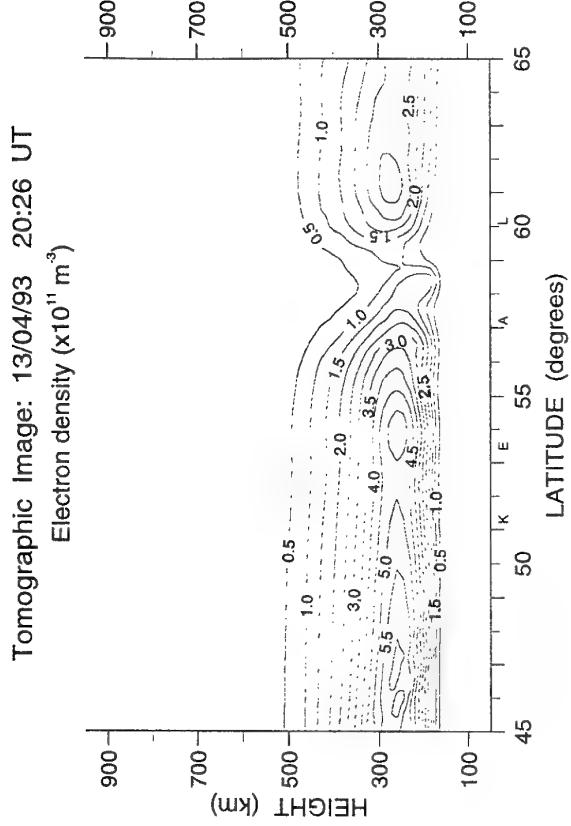
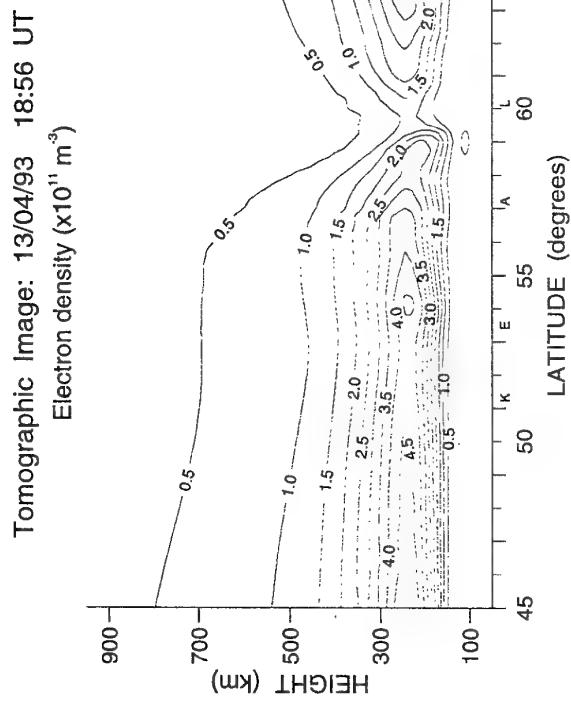
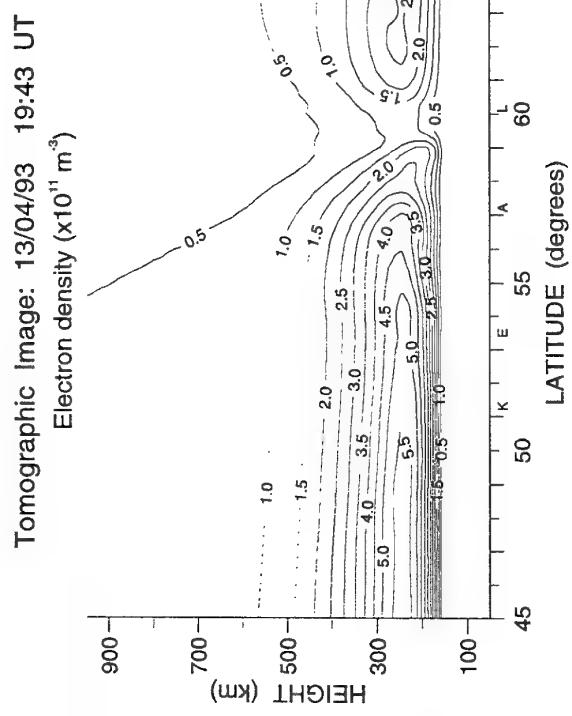
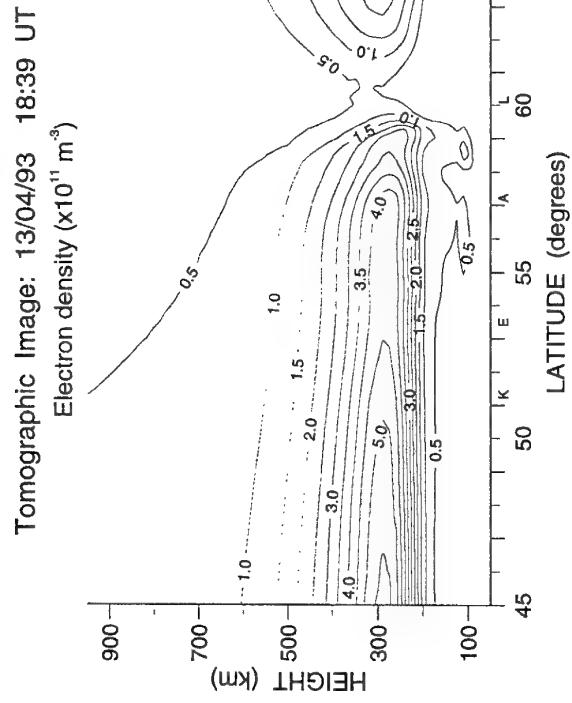
Tomographic Image: 13/04/93 10:36 UT

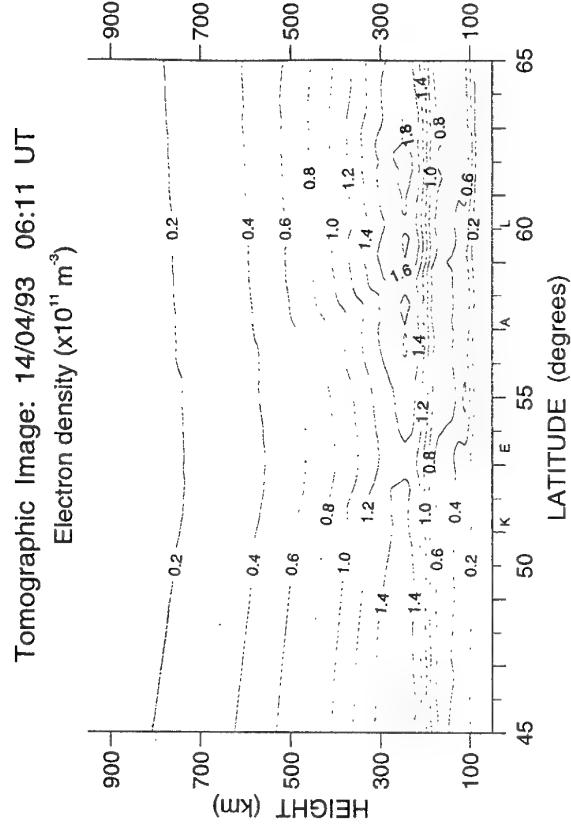
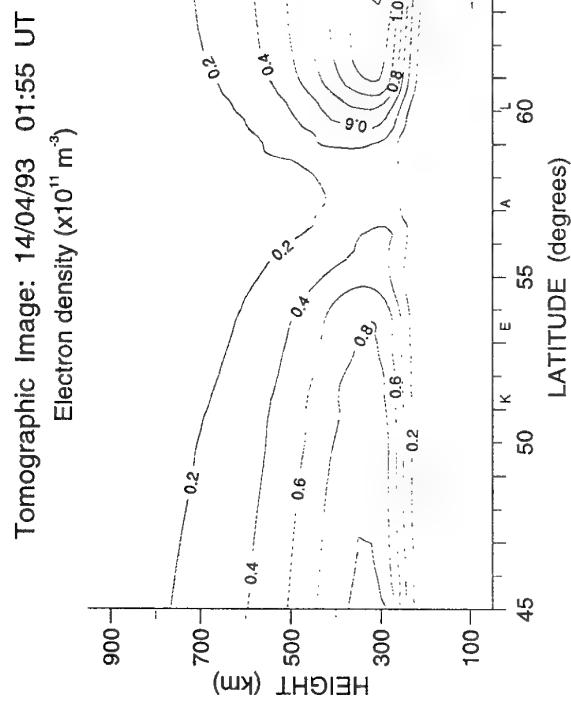
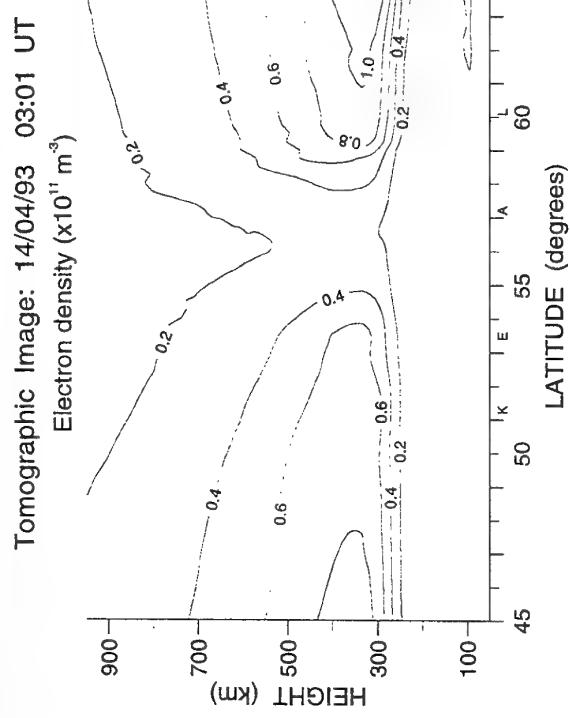
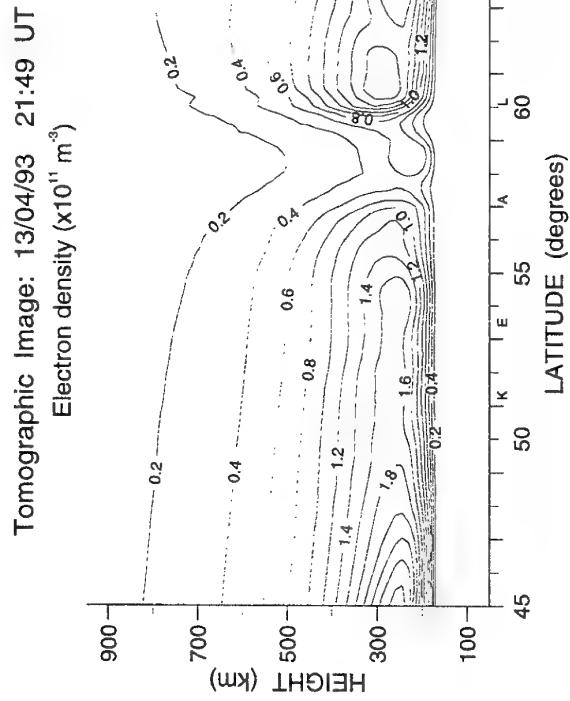


Tomographic Image: 13/04/93 08:15 UT

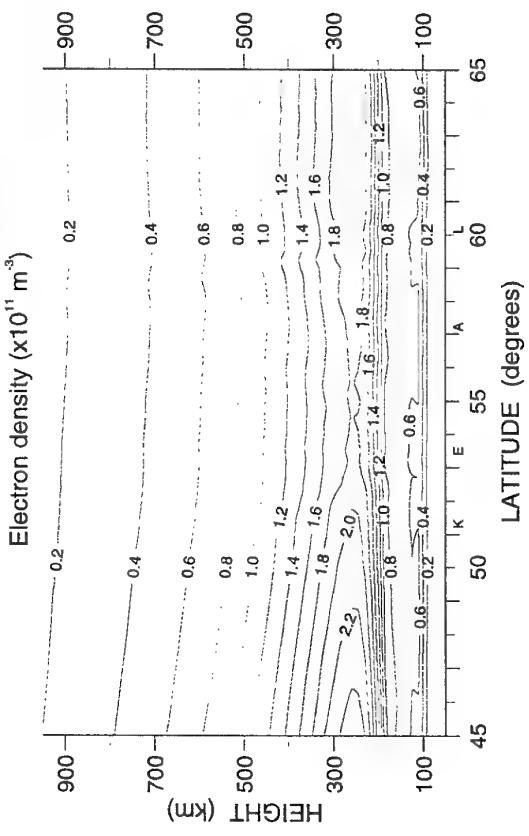




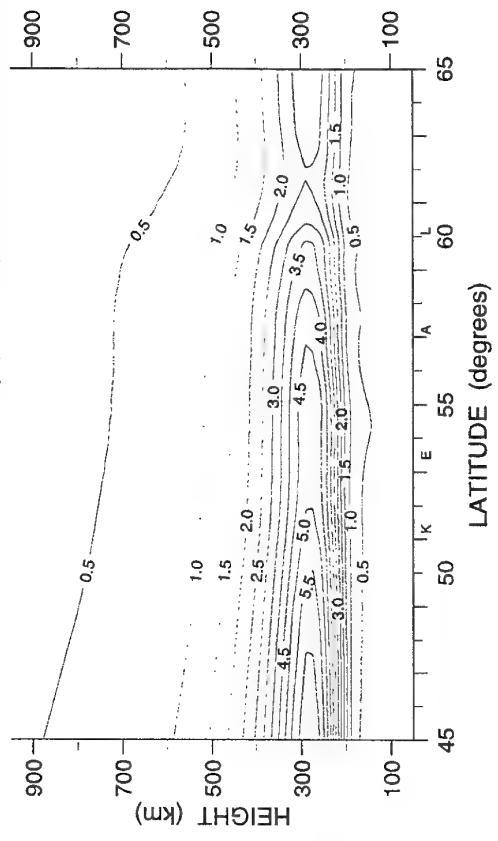




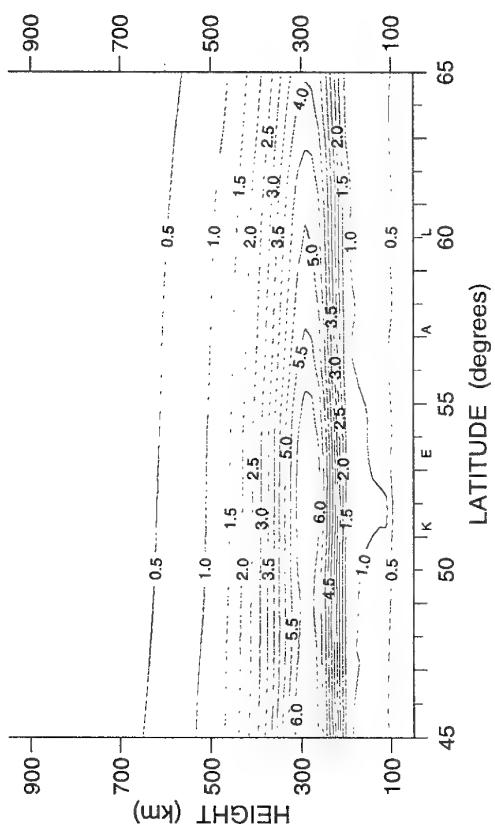
Tomographic Image: 14/04/93 06:48 UT



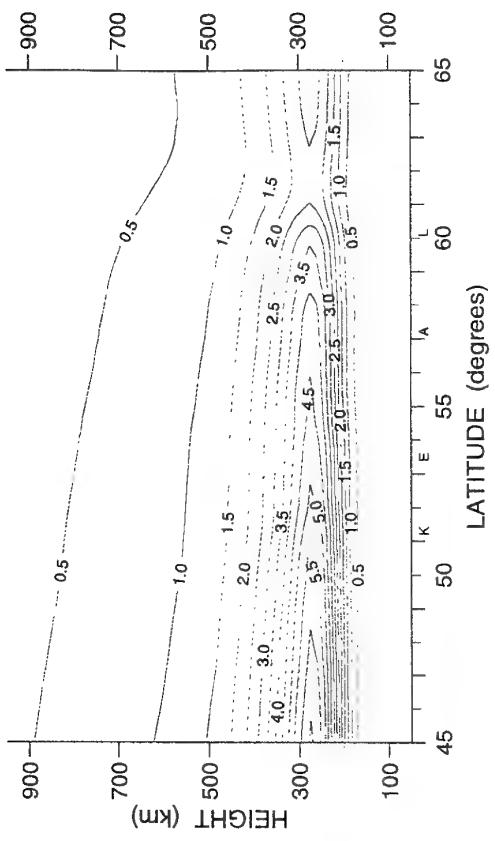
Tomographic Image: 14/04/93 18:33 UT



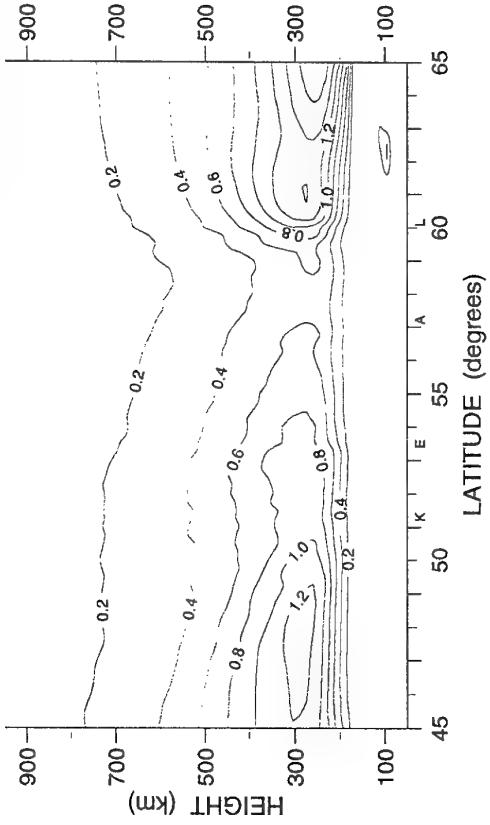
Tomographic Image: 14/04/93 16:44 UT



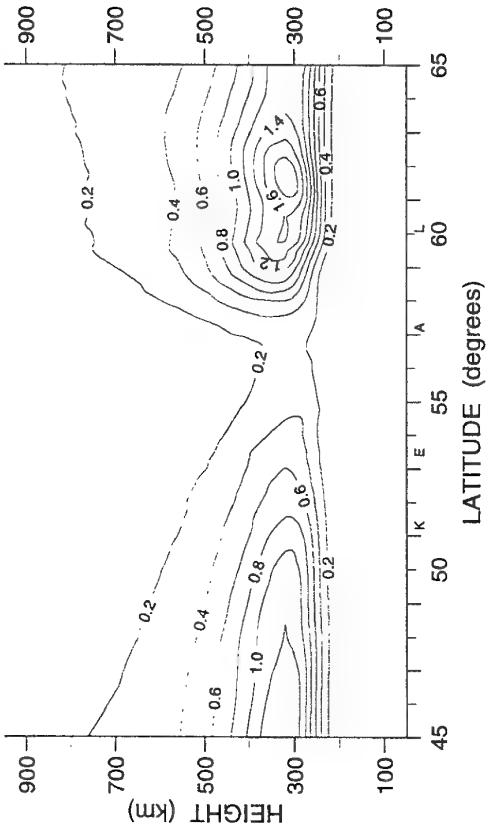
Tomographic Image: 14/04/93 18:60 UT



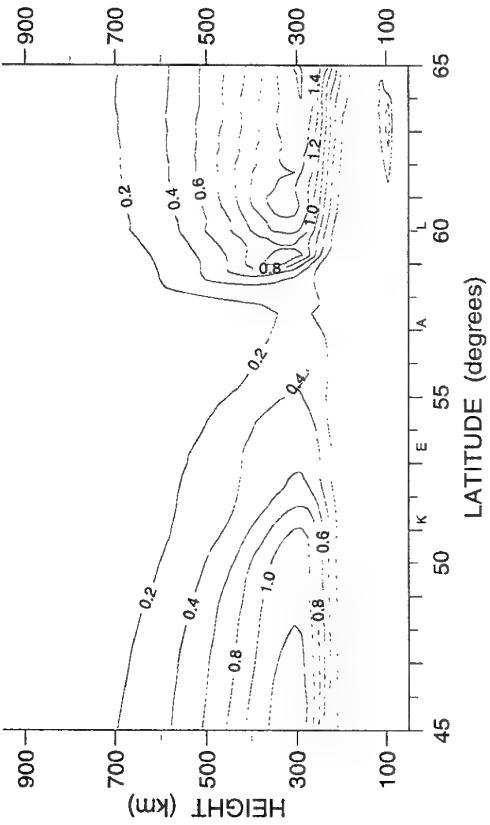
Tomographic Image: 14/04/93 23:10 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



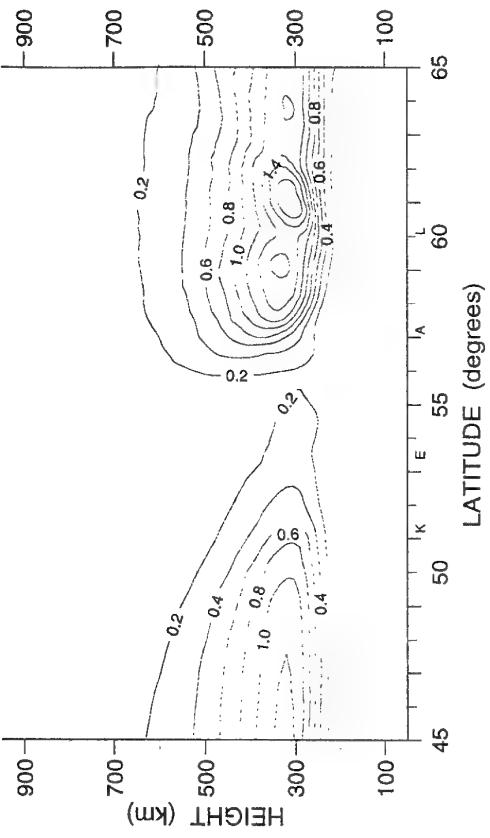
Tomographic Image: 15/04/93 02:38 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



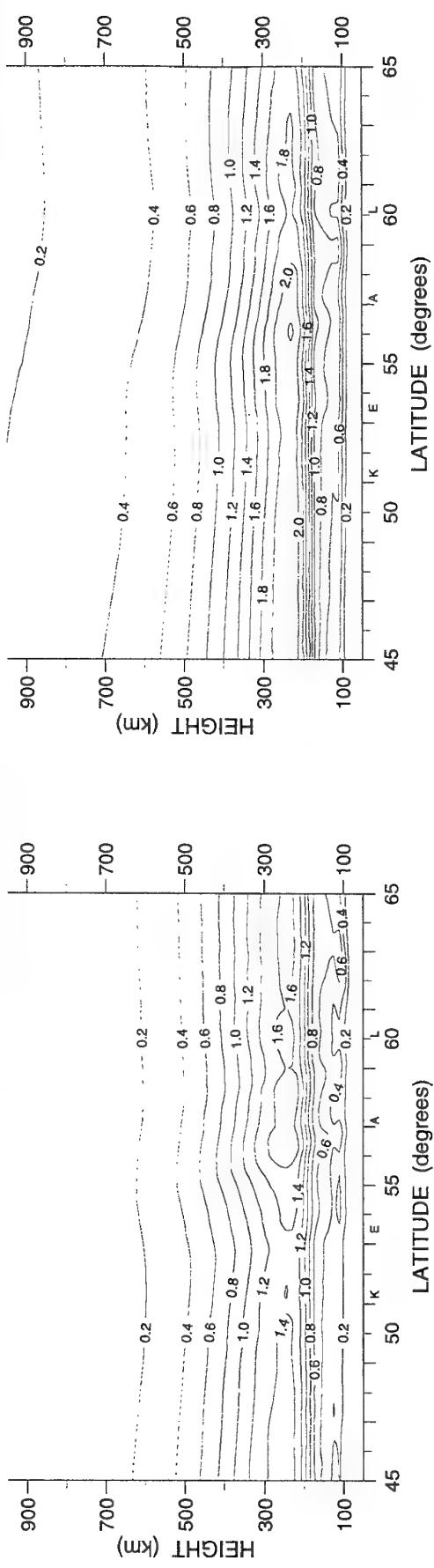
Tomographic Image: 15/04/93 01:10 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



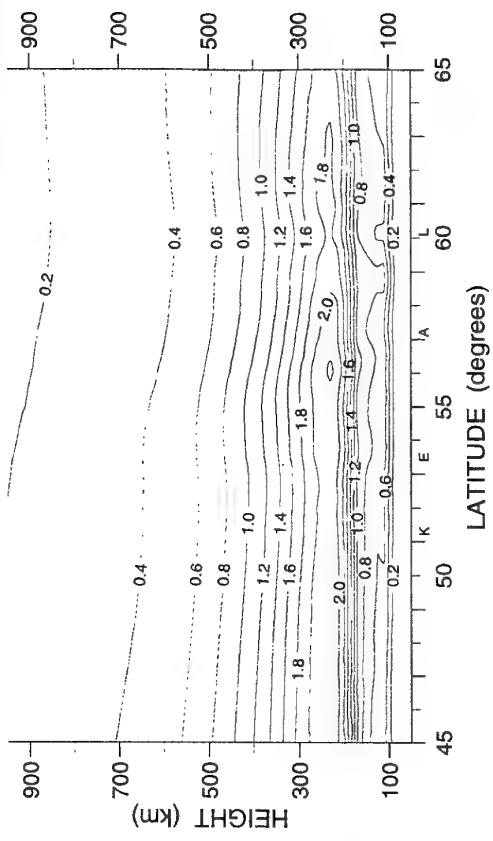
Tomographic Image: 15/04/93 02:57 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



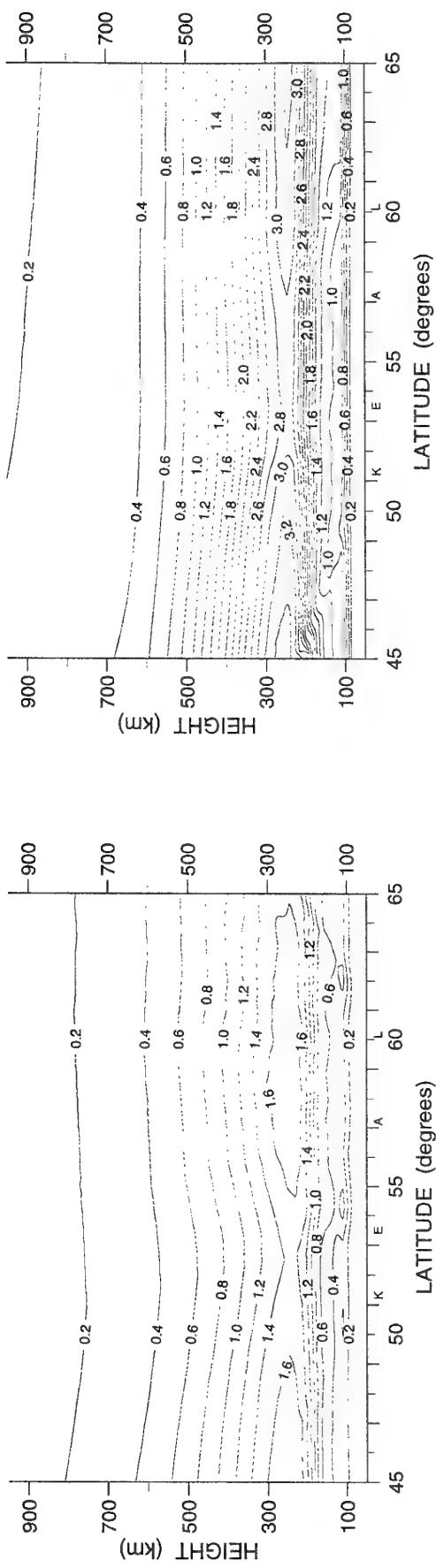
Tomographic Image: 15/04/93 05:48 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



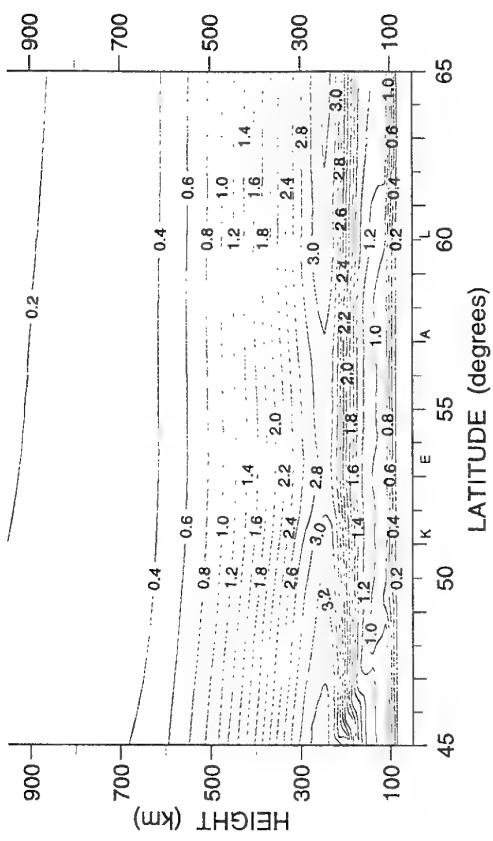
Tomographic Image: 15/04/93 06:48 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



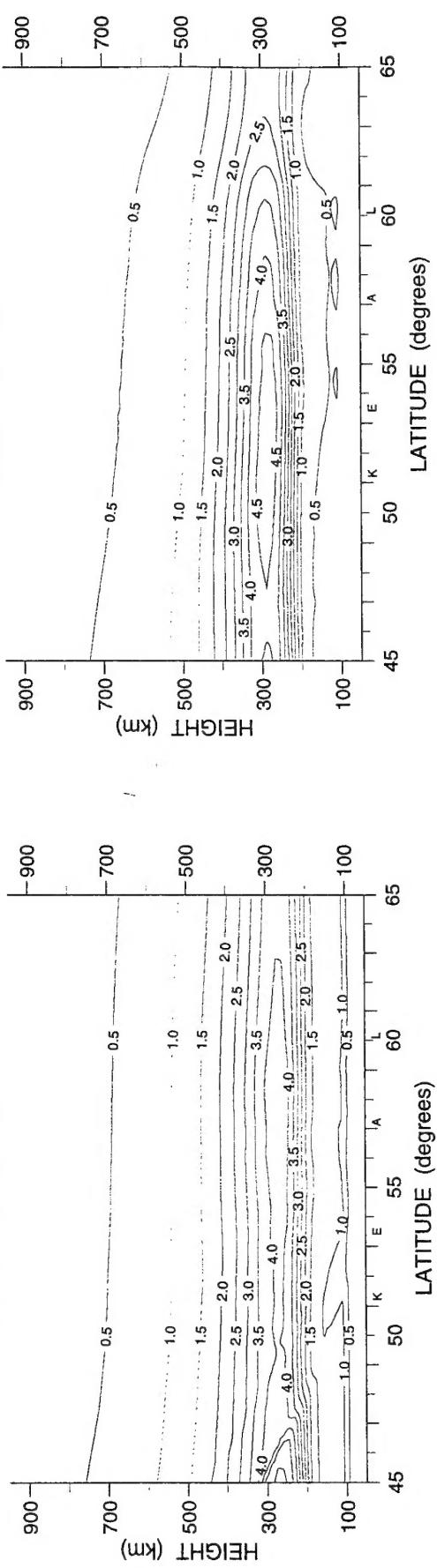
Tomographic Image: 15/04/93 06:05 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



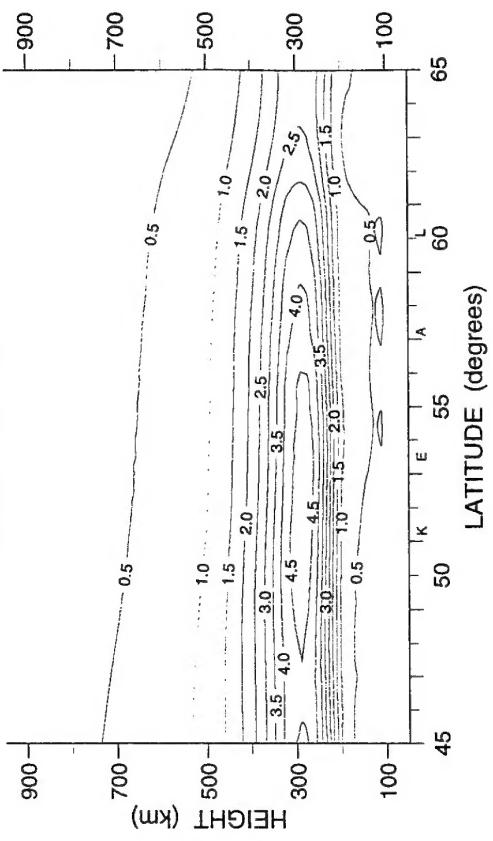
Tomographic Image: 15/04/93 14:60 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



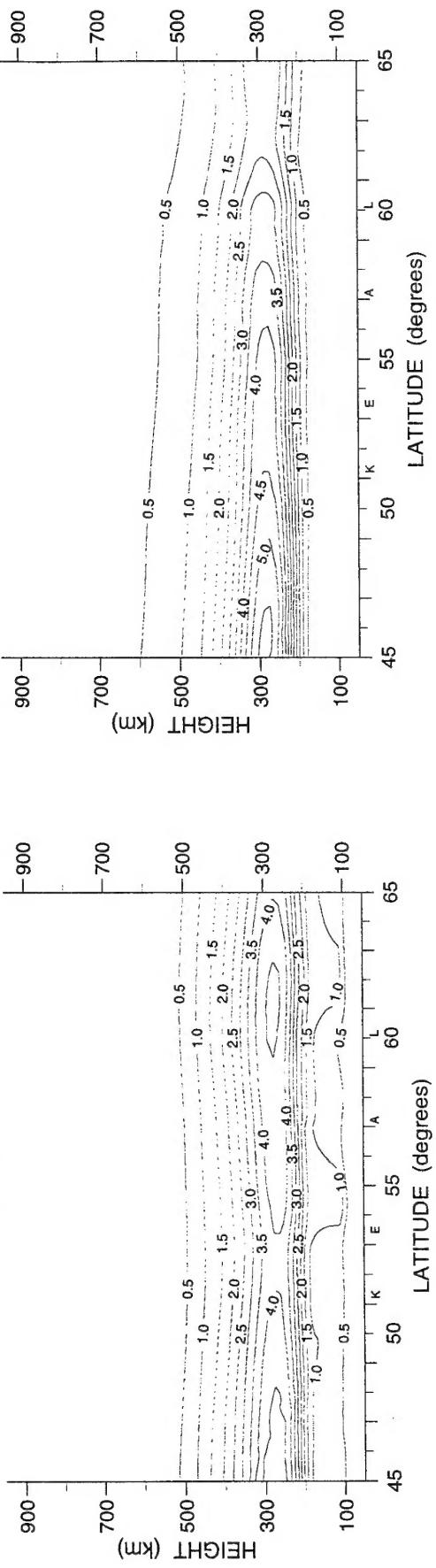
Tomographic Image: 16/04/93 14:37 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



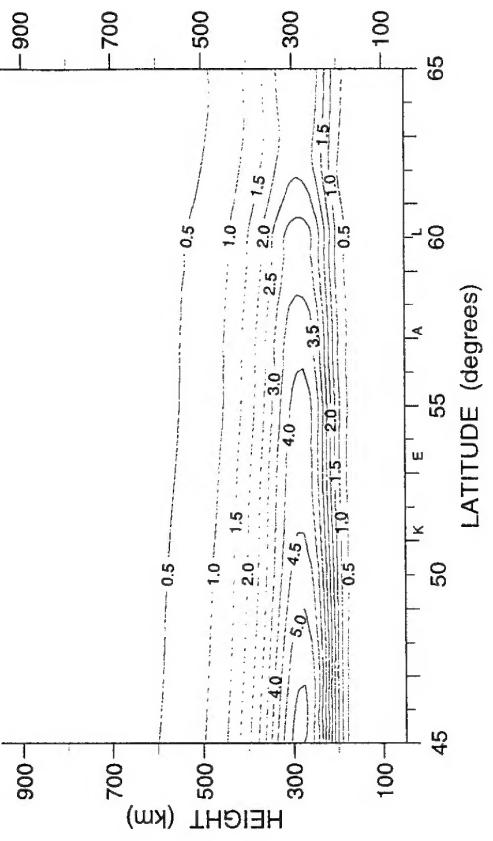
Tomographic Image: 16/04/93 18:16 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

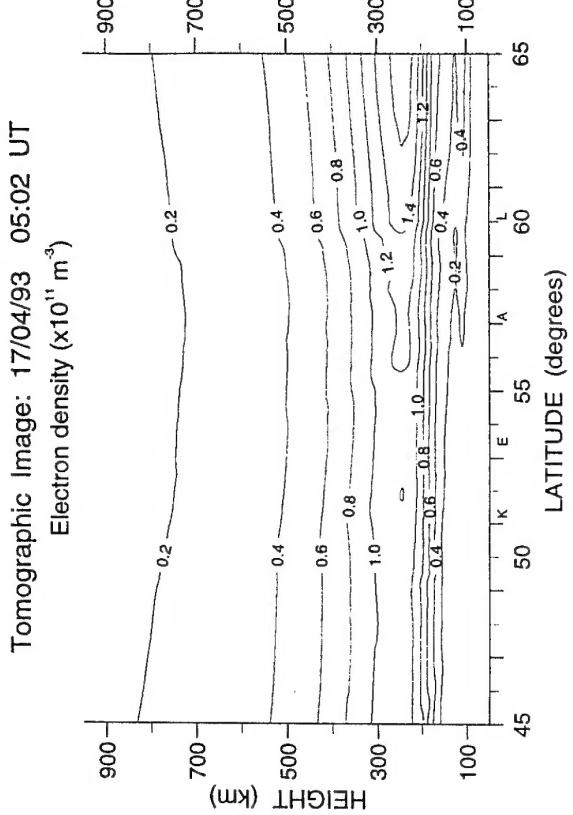
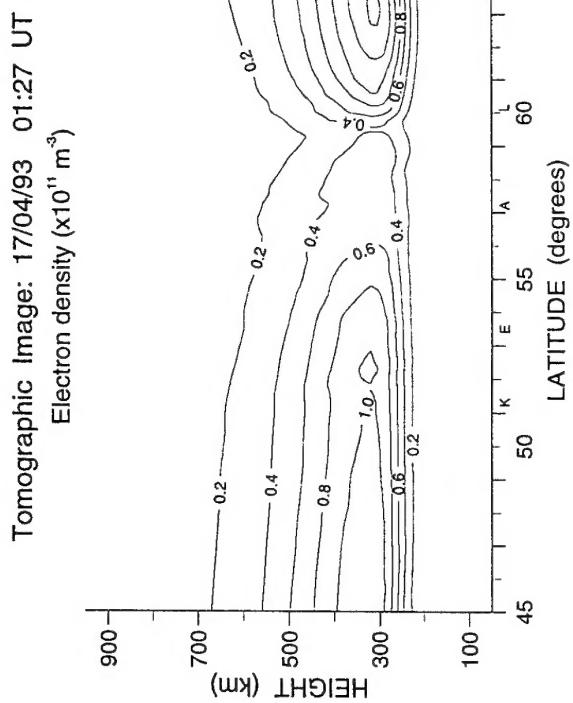
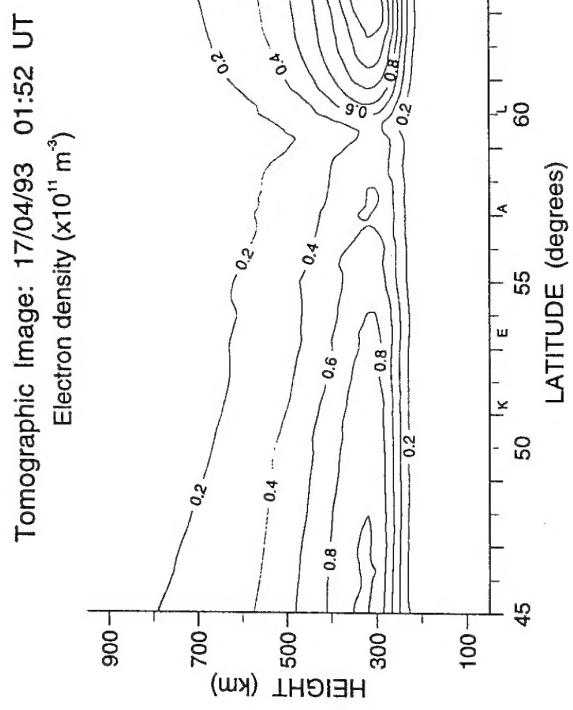
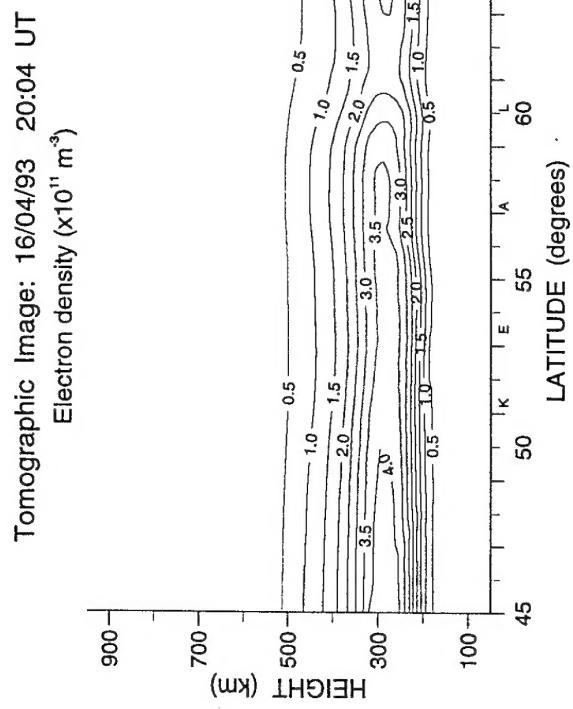


Tomographic Image: 16/04/93 16:25 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

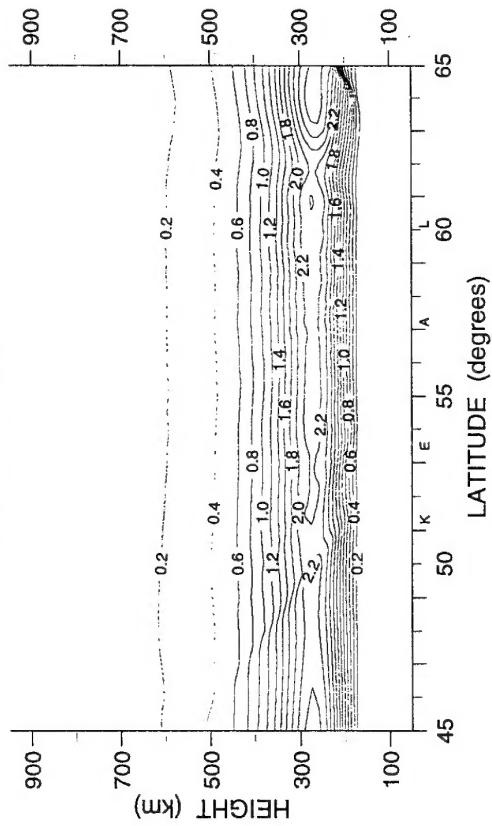


Tomographic Image: 16/04/93 19:21 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

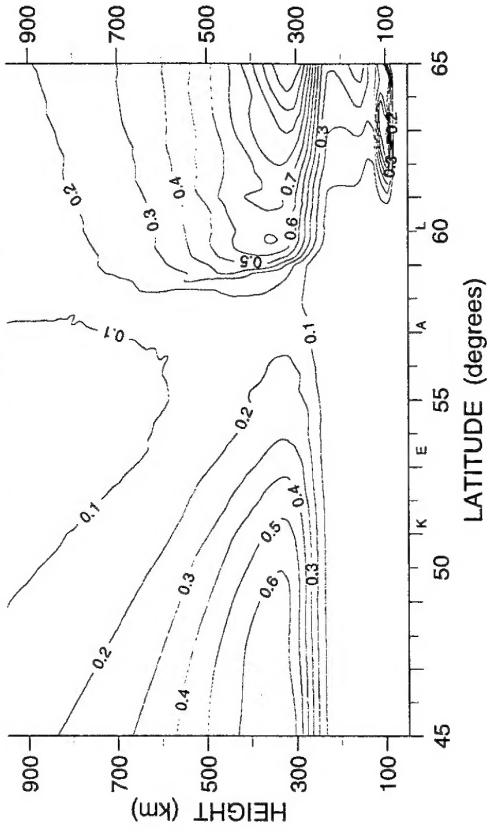




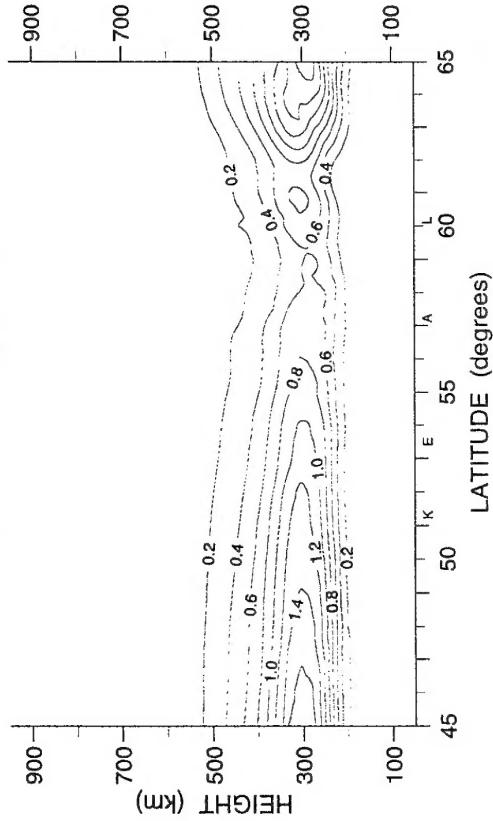
Tomographic Image: 17/04/93 21:47 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



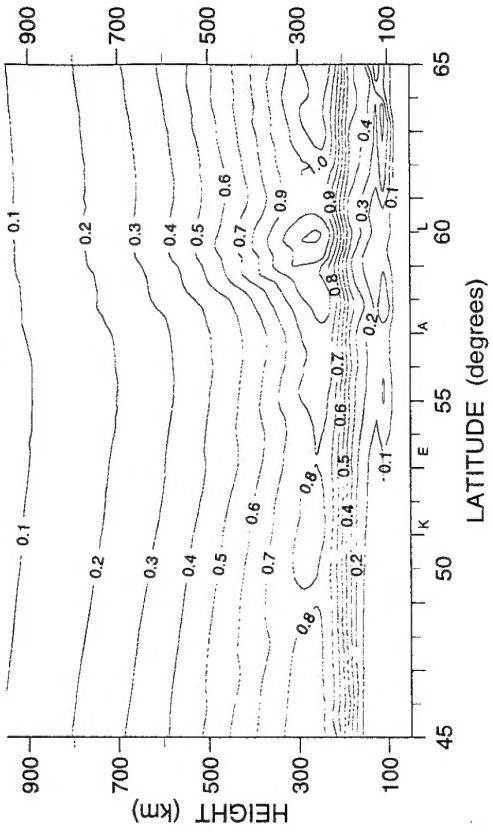
Tomographic Image: 18/04/93 03:18 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

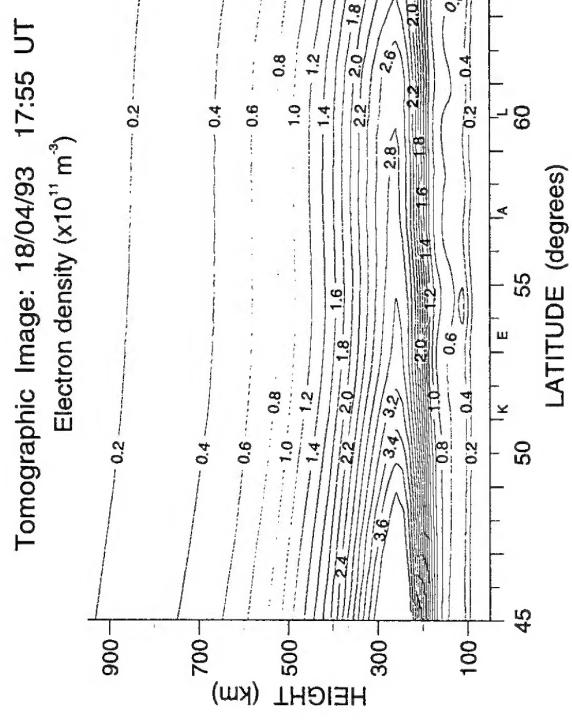
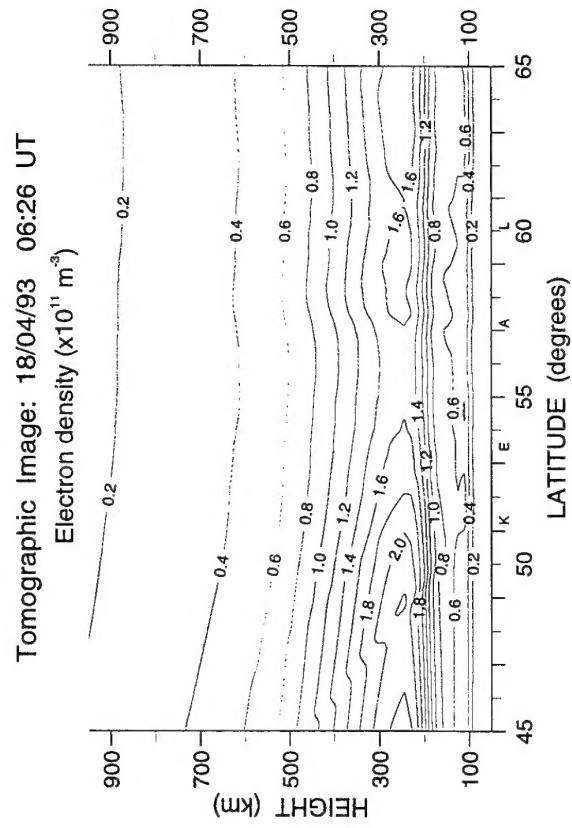


Tomographic Image: 18/04/93 00:42 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )

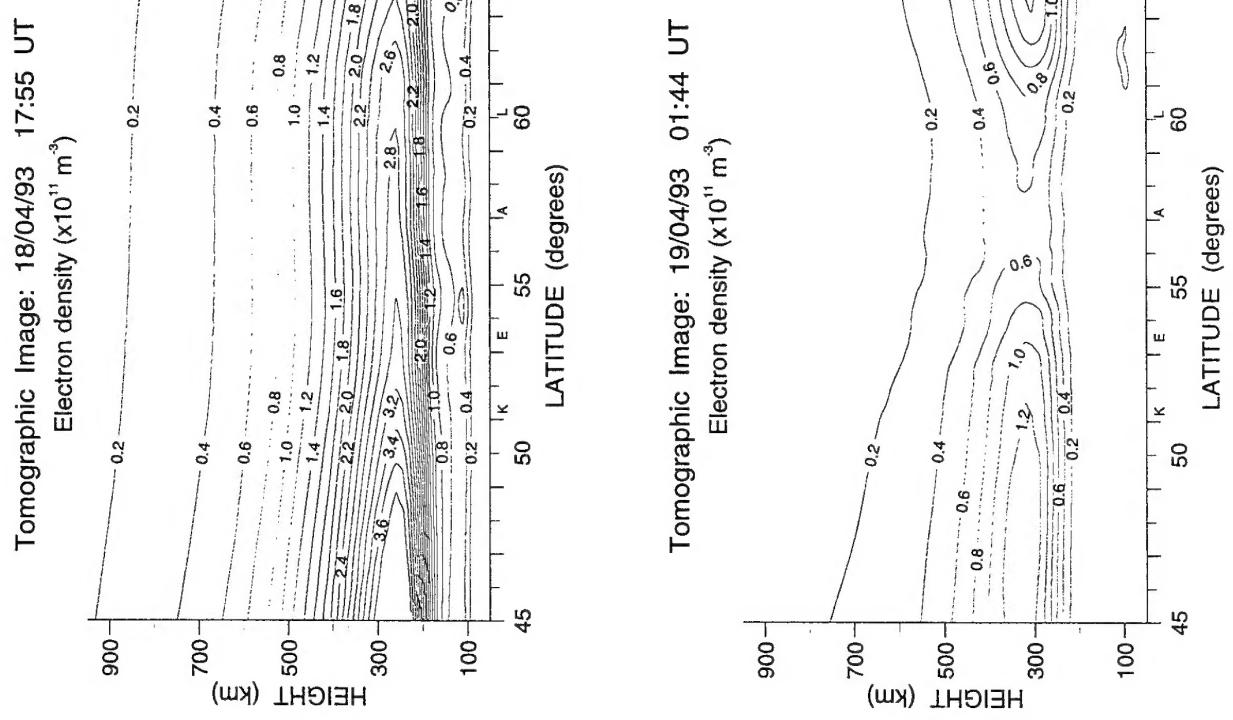
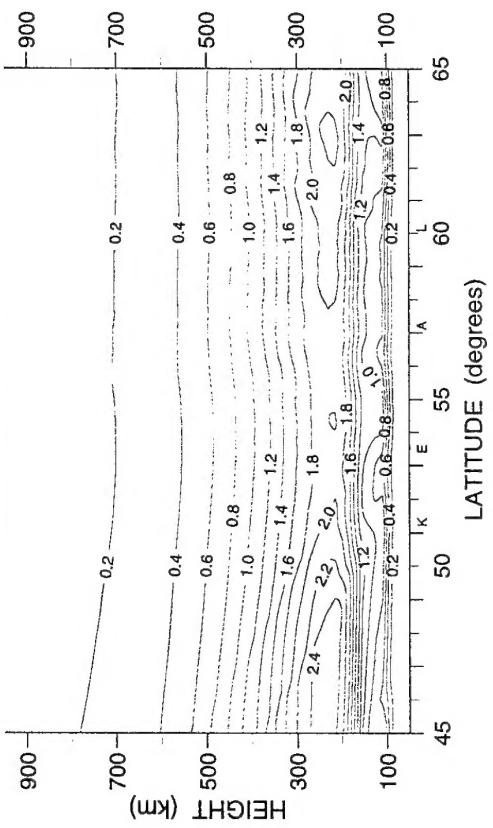


Tomographic Image: 18/04/93 04:39 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )





Tomographic Image: 18/04/93 07:31 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )



Tomographic Image: 19/04/93 01:44 UT  
Electron density ( $\times 10^{11} \text{ m}^{-3}$ )